List of Effective Pages

CHAPTER 30 - ICE AND RAIN PROTECTION

CH-SE-SU	PAGE	DATE
30-LOEP	1	Jun.16
30-CONTENTS	1/2	Jun.13
30-00-00	1	Mar.02
30-10-00	1 thru 6	Sep.08
	501/502	Mar.02
30-10-25	401/402	Mar.02
30-10-35	201 thru 203	Mar.02
30-10-43	401 thru 403	Dec.15
	601/602	Mar.02
30-10-52	201 thru 203	Sep.08
30-10-72	301 thru 303	Jun.13
	401 thru 405	Jun.16
	701 thru 704	Sep.01
	801/802	Feb.99
30-35-00	1	Sep.01
30-35-15	501/502	Mar.03
30-41-00	1 thru 5	Mar.08
	501 thru 504	Mar.02
30-80-00	1/2	Jul.95
	501/502	Mar.02
30-80-11	201 thru 203	Mar.02

CHAPTER 30

ICE AND RAIN PROTECTION

TABLE OF CONTENTS

GENERAL

Subject	*Ch-Se-Su*	*Page*
ICE AND RAIN PROTECTION	30-00-00	
Description		1

AIRFOIL

Subject	*Ch-Se-Su*	*Page*
AIRFRAME ICE PROTECTION SYSTEM	30-10-00	
Description and Operation		1
Adjustment/Test		501
PIPE COUPLINGS	Refer to AMM 125/H-20, 20-10-11, 201	
PROPORTIONING UNITS	30-10-25	
Removal/Installation		401
DE-ICING FLUID TANK	30-10-35	
Maintenance Practices		201
DE-ICING PUMP	30-10-43	
Removal/Installation		401
Inspection/Check		601
FILTER ASSEMBLY	30-10-52	
Maintenance Practices		201
DISTRIBUTOR PANELS	30-10-72	
Servicing		301
Removal/Installation		401
Cleaning/Painting		701
Approved Repairs		801

PITOT AND STATIC

Subject	*Ch-Se-Su*	*Page*
PITOT/STATIC DE-ICING SYSTEM	30-35-00	
Description and Operation		1
STATIC PLATES (Moved to 34-11-29, Parts 1 and 2)		
PITOT/STATIC HEATERS	30-35-15	
Adjustment/Test		501

Subject	Ch-Se-Su	Page
WINDOWS, WINDSHIELDS AND DOORS		
WINDSHIELD ELECTRICAL DE-ICING SYSTEM	30-41-00	
Description and Operation		1
Adjustment/Test		501
DETECTION		
ICE DETECTION SYSTEM	30-80-00	
Description and Operation		1
Adjustment/Test		501
ROTARY ICE DETECTOR	30-80-11	
Maintenance Practices		201

ICE AND RAIN PROTECTION - DESCRIPTION

1. Airframe ice protection system

A fluid system is employed for de-icing the wings and horizontal stabilizers.

Nylon pipes are used throughout the system, and Simplifix type couplings are used to make all pipe joints.

2. Pitot/Static ice protection system

The pitot heads and their masts, the front static plates, and the stall warning airflow direction detector vanes are all wired for electrical heating.

3. Windshield ice protection system

The flight compartment forward-facing panels and front side panels embody elements for electrical heating.

4. Ice detection

Formation of ice is detected by a 'rotary' ice detector unit which completes an electrical circuit to an ICE DETECTD annunciator on roof panel CG. The warning is repeated on the MWS ICE PROT annunciator.

A spot light on each side provides illumination of the left and right wing leading edge.

5. Engine nose cowl ice protection system

For the engine nose cowl ice protection system, refer to Chapter 75, AIR - ENGINE ANTI-ICING.

ICE AND RAIN PROTECTION
AIRFOIL
AIRFRAME ICE PROTECTION SYSTEM
DESCRIPTION AND OPERATION

1. DESCRIPTION

An airframe ice protection system is provided as shown (Ref. Figure 1) with the detailed fuselage component location (Ref. Figure 2) and the associated schematic wiring diagram (Ref. Figure 3).

De-icing fluid is stored in a tank which is vented to cabin pressure through a main rising pipe and a secondary vent pipe connected to the forward face of the tank and coupled to the rising pipe.

The de-icing fluid pump is a two-speed compound wound 28 volt d.c. motor-driven unit, controlled by a WING/TAIL ANTICE time switch located on the flight compartment roof panel CG. The time switch is clockwork-driven such that the action of setting the pointer winds the clockwork mechanism for any period up to a maximum of 10 minutes.

When the switch is reset from zero, the pump will run at high speed for 1 minute and then revert to normal speed for the remainder of the time selected. This facility provides an approximate 50% increase in initial flow rate which aids system priming. The increased 'priming' flow can be selected at any time by resetting the switch from zero. If the switch is reset prior to reaching zero, then priming flow will not be supplied.

When the time switch has run down to zero, audio warning is given by an antice chime unit or tone generator and directed through the Audio Integrating System (Collins installations (Ref. 23-50-67) and Honeywell installations (Ref. 23-51-05)) to headset/speakers to indicate that pump operation has ceased.

Indication of low fluid supply pressure is given, after a 15 second delay (to allow initial pressure build-up), by the amber ANTICE LO PRESS annunciator on the roof panel and the amber ICE PROT↑ repeater annunciator on the MWS panel.

Indication of de-icing fluid tank contents is provided by a gauge mounted on the front main panel of the pilots' right-hand console. The gauge is a moving coil d.c. voltmeter, calibrated to indicate de-ice fluid levels, and is electrically connected to a vertically mounted transmitter in the tank. The transmitter (Ref. Figure 2 and Figure 3) consists of a chain of resistors arranged as a potential divider, reed switches connected between the resistors and the output to the gauge, and a sliding float assembly with integral magnet. The magnet will operate a reed switch to connect a voltage from the potential divider, proportional to fluid level, to the contents gauge.

When the tank contents fall below the level approximately equal to 30 minutes fluid supply remaining, a switch within the transmitter operates an amber ANTICE LO QTY annunciator on the roof panel and the amber ICE PROT↑ repeater annunciator on the MWS panel. A 25 second time delay is incorporated in the circuit to prevent false indications due to fluid movement in the tank when the level is near that at which the switch operates.

2. OPERATION

A. General

With the d.c. busbars energized, capacitor EL is fully charged. Selecting the WING/TAIL ANTICE time switch for a period of operation up to 10 minutes allows capacitor EL to discharge and also connect a PS2 busbar supply to operate the motor-driven pump (Ref. Figure 1 and Figure 2).

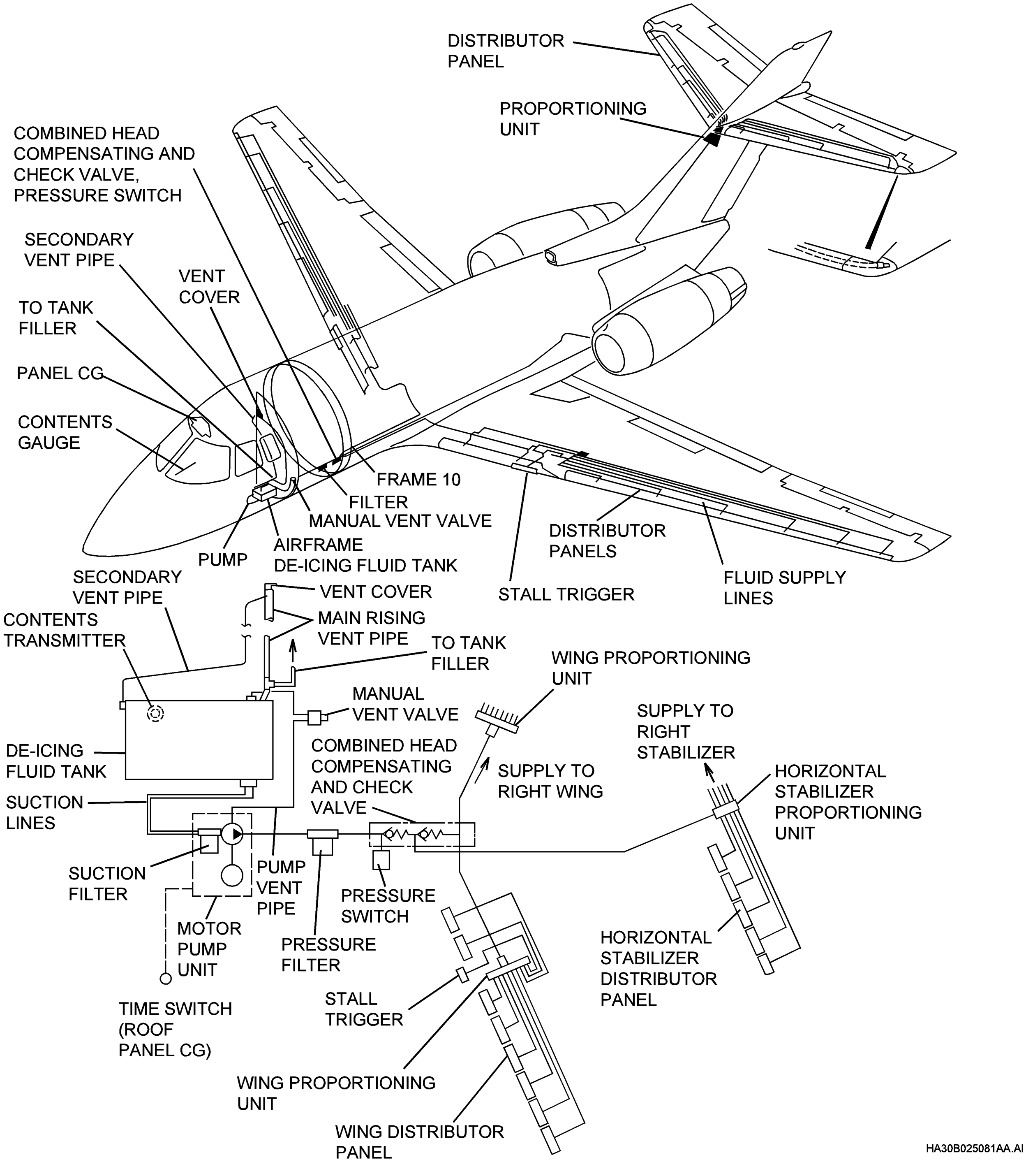


Figure 1
Airframe Ice Protection System

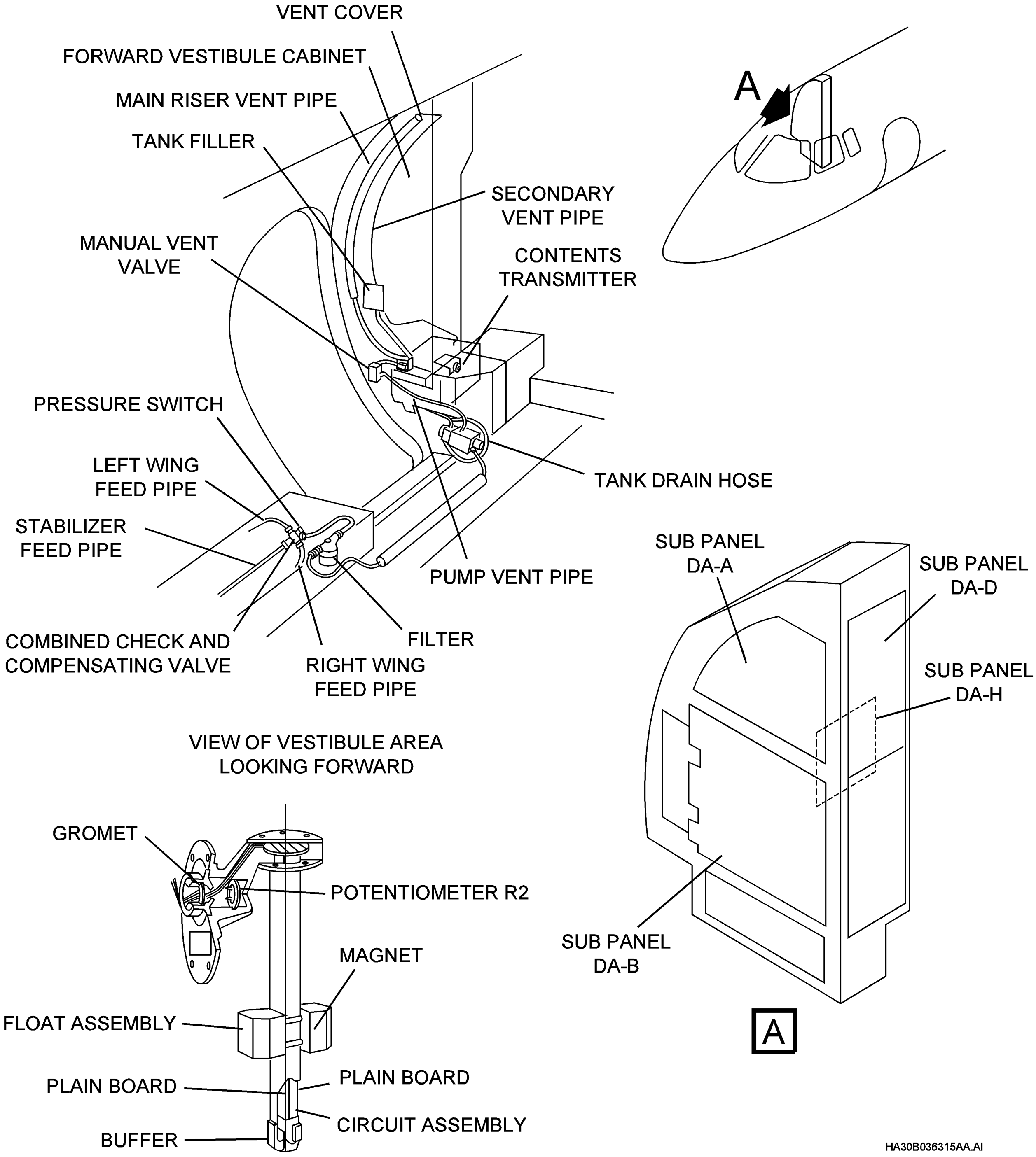


Figure 2
Ice Protection System Equipment Installation in Fuselage

De-icing fluid is drawn from the tank through a suction filter to the pump where its output is fed through the pressure filter and the check valve, which opens when delivery pressure reaches 10 psi. The head compensating valve, which is set at approximately 4.5 psi, makes sure equal fluid pressure at the wings and horizontal stabilizers. The fluid next passes to the wing and horizontal stabilizers proportioning units and finally to the distribution panels at the aerofoil leading edges.

The proportioning units have accurately calibrated metering plugs through which the fluid is apportioned to each individual distributor. This makes sure that if a pipe disconnect takes place in service the fluid supply to the other outlets is maintained. A non-return valve in each proportioner outlet prevents back-flow of fluid.

The outboard distributor panel on each wing is constructed of laser drilled titanium. At each distributor panel the de-icing fluid enters a cavity before passing through a micro-porous plastic sheet to a sintered mesh stainless steel or laser drilled titanium outer skin. As fluid escapes to atmosphere, it is directed, by the airflow, rearward over the aerofoil.

To facilitate purging of air during system priming, each distributor panel incorporates a capillary tube which enters the rear of the panel at a high point in the cavity, and exits at a low point on the front face of the panel. As fluid is pumped into the cavity, trapped air will escape through the capillary tube. During normal system operation a small quantity of fluid will bleed from this tube. A non-return valve and protective filter screen installed in the capillary tube prevent air entering the cavity when the system is inoperative.

The motor driven pump supplies fluid to the distributor panels at two flow rates, initially for 1 minute at high rate and the remaining time at normal rate. The initial rate makes sure of rapid priming of the system.

When the time switch runs down to zero, PS2 busbar supply is automatically disconnected by the switch from the pump motor and connected to the chime circuit or tone generator, as applicable, and fed into the Audio Integrating System central control unit. The resultant sound is audible over the flight compartment headsets or speakers and indicates that the de-icing fluid pump has ceased to operate as the cycle is complete.

Due to the charge build-up on capacitor EL the current through relay GD coil falls, and subsequently the relay becomes de-energized. The relay contacts revert to the relaxed position and breaks the chime or tone unit earth return circuit, to cancel the audible warning.

B. Tank Contents Indication

When the de-icing fluid tank is full, the transmitter float assembly is fully raised and the integral magnet closes the contacts of the reed switch RS1 (Ref. Figure 3), connecting the meter across the part of the potential divider made up of resistors R3 to R14. The potential at this point is set by resistor R2 to give full scale deflection of the meter.

As the fluid level falls the float assembly moves towards RS2; due to the magnetic linkage RS1 will open after RS2 closes, to make sure of continuity of gauge indication. With RS2 closed and RS1 open the contents gauge is connected across resistors R4 to R14 and a reduced potential proportional to the fall in fluid level is applied to the gauge. A falling level of fluid from full to empty will result in a total of 12 switching steps, each step progressively switching a further step down the potential divider.

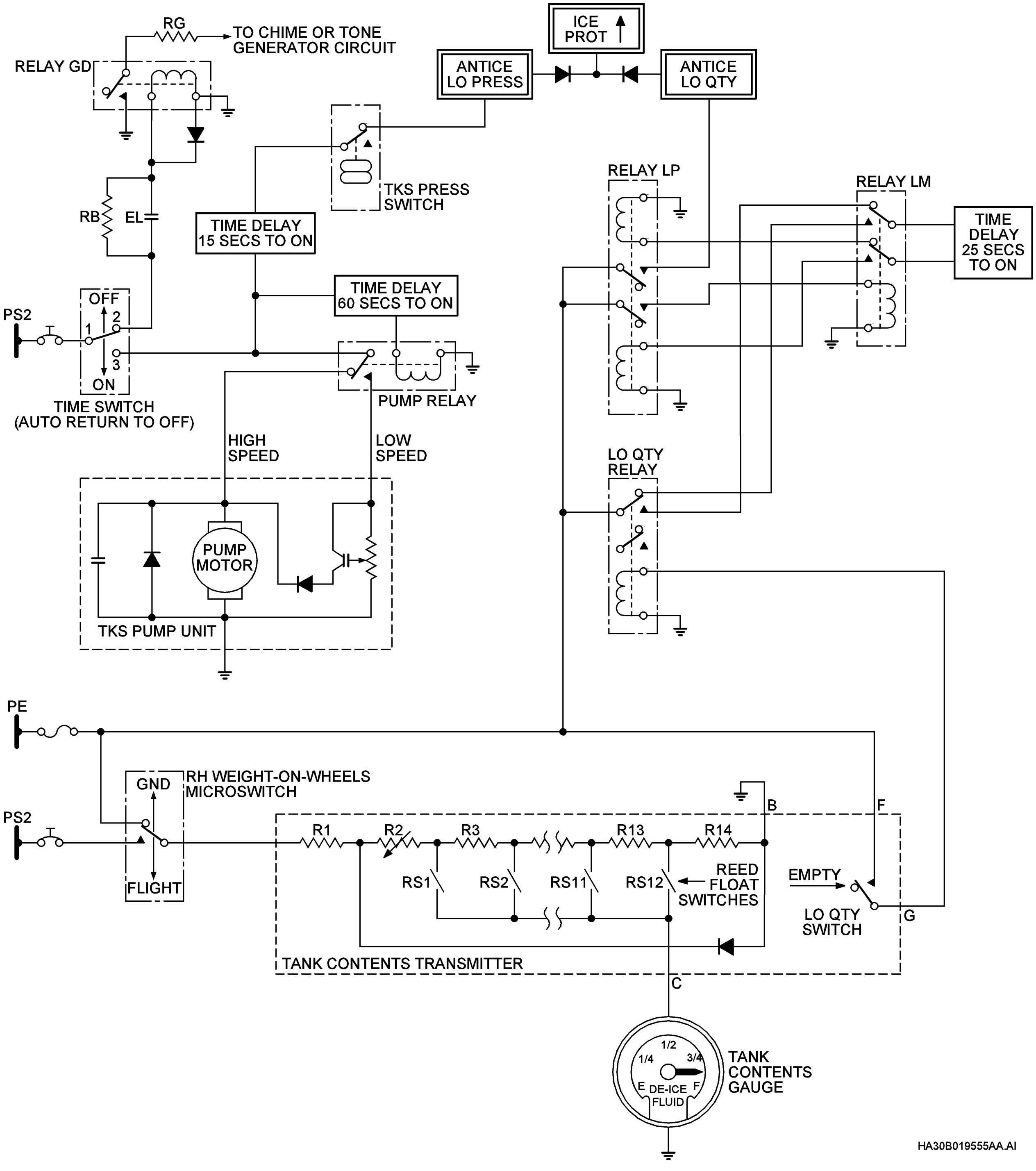


Figure 3
TKS Airframe De-icing Schematic Wiring Diagram

When the fluid level falls below the level at which there is approximately 30 minutes fluid remaining, the LO QTY switch contacts close and direct a supply from PE busbar to energize the LO QTY relay. The 25 second time delay is then energized from PE busbar through the operated contacts of the LO QTY relay and the relaxed contacts of relay LM. If, after 25 seconds, the LO QTY switch contacts are still made, the output from the time delay unit will energize relay LP through the relaxed contacts of relay LM. Relay LP contacts change over to connect a supply from PE busbar to the ANTICE LO QTY annunciator on the roof panel CG and the ICE PROT↑ repeater annunciator in the MWS, and to energize relay LM to disconnect the input to the time delay unit.

When the fluid is replenished, the LO QTY switch contacts will open to de-energize the LO QTY relay. A PE busbar supply is then connected through its relaxed contacts and the operated contacts of relay LM to energize the time delay unit. After 25 seconds the output from the time delay unit is routed through the operated contacts of relay LM to energize relay LP whose contacts open to disconnect the supplies to the annunciator and the coil of relay LM.

AIRFRAME ICE PROTECTION SYSTEM - ADJUSTMENT/TEST

1. Flush and pressure test the airframe ice protection system

CAUTION: DO NOT RUN THE PUMP WITH THE TANK EMPTY.

A. Procedure

(1) Energize the a.c. and d.c. busbars (Chapter 24, ELECTRICAL POWER).

(2) Disconnect the pipes to the wing/horizontal stabilizer distributor panels.

(3) Make sure the de-icing fluid tank is not less than half full.

(4) Operate the pump to prime the system.

(5) When fluid comes out of the ends of the pipes, install blanks to the pipes.

(6) With the pump running and starting at the wing tips and horizontal stabilizers, remove the blank from each pipe in turn and collect approximately 1/8 of a pint of fluid, reinstall the blanks and switch off the pump.

(7) Disconnect the system at the pump outlet. Pressurize the system with nitrogen to 150 psi, keep this pressure for 10 minutes and make sure there are no leaks in the system.

(8) Remove the blanks, connect the pipes to the distributor panels and connect the pump. Wirelock the connections.

(9) Prime and functionally test the ice protection system (paragraph 2.).

2. Prime and functionally test the airframe ice protection system

CAUTION: DO NOT RUN THE PUMP WITH THE TANK EMPTY.

A. Procedure

(1) Energize a.c. and d.c. busbars (Chapter 24, ELECTRICAL POWER).

(2) Make sure the de-icing fluid tank is not less than half full.

NOTE: The Audio Integrating System must be complete and operative (Chapter 23, AUDIO INTEGRATING SYSTEM).

(3) Select the WING/TAIL ANTICE time switch to an appropriate period of operation, and check that fluid flows from the major portion of each distributor.

NOTE: The time taken for fluid to flow from the distributors, and its distribution pattern, depends on ambient temperature and related fluid viscosity. At ambient temperatures below or near freezing point, when fluid viscosity is high, the time taken to achieve paragraph (3) above on initial priming will be longer. At higher temperatures, with consequent lower fluid viscosity, flow from the distributors should be readily achieved in a few minutes.

(4) When the timing cycle(s) is complete, make sure that an acceptable level of audio tone warning is heard on pilots' headsets. If necessary, adjust chime unit R25 potentiometer on panel DA.

(5) On the flight compartment roof panel CG, set the NO SMKG switch to ON, and make sure that an acceptable level of compartment audio warning is given. Return NO SMKG switch to OFF and repeat check using SEAT BELTS switch.

(6) De-energize busbars (Chapter 24, ELECTRICAL POWER).

(7) Fill the de-icing fluid storage tank (Chapter 12, ICE AND RAIN PROTECTION).

B. Close up

(1) Make sure the work area is clean and clear of tools and miscellaneous items of equipment.

PROPORTIONING UNITS - REMOVAL/INSTALLATION

1. Proportioning units *(Figure 401)*

A. Removal

(1) On panel DA-D, open and safety tag circuit breaker WING TAIL ANTICE PUMP.

(2) To get access to the proportioning units in the wings, remove panel W438 on the left wing or W338 on the right wing (Aircraft Flexible Maintenance Schedule (P/N: AFMS - 800XP), Part 6).

(3) To get access to the proportioning unit in the horizontal stabilizer, remove panels T4L, T4R and T5 (AFMS- 800XP, Part 6).

(4) Be prepared to collect any spilled de-icing fluid.

(5) At the proportioning unit, disconnect the inlet and outlet connections. Make sure the outlet pipe ends are correctly identified with the proportioning unit connector numbers.

(6) Remove the two bolts and the proportioning unit from the airplane.

(7) Install blanks on the ends of the inlet and outlet connector and pipe ends.

B. Installation

(1) To install a proportioning unit in a wing, position the unit on leading edge riblet No. 5B. Install and tighten the two bolts.

(2) To install a proportioning unit in the horizontal stabilizer, position the unit at the center of the leading edge. Install and tighten the two bolts.

(3) Remove the blanks from the connector and pipe ends.

(4) Connect the pipes to the inlet and outlet connectors. Make sure that the outlet pipes are connected to the correct connectors. Make sure that the pipes are free from tension; tighten the connections and wirelock.

(5) On panel DA-D remove the safety tag and close circuit breaker WING TAIL ANTICE PUMP.

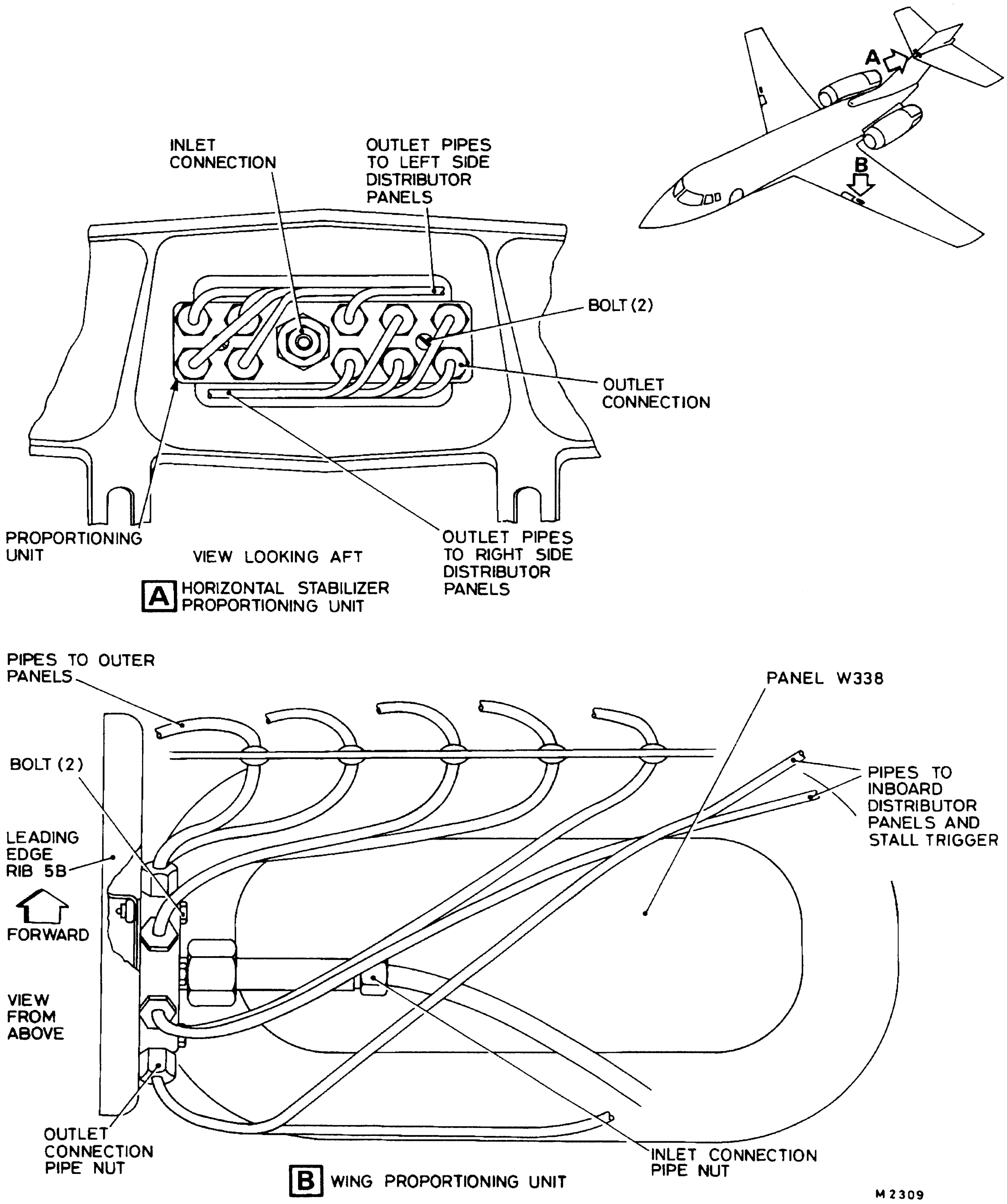
(6) Flush and pressure test the wing/horizontal stabilizers (AIRFRAME ICE PROTECTION SYSTEM - ADJUSTMENT/TEST).

(7) Prime and functionally test the airframe ice protection system (AIRFRAME ICE PROTECTION SYSTEM - ADJUSTMENT/TEST).

(8) Install panel W438 on the left wing, W338 on the right wing or panels T4L, T4R and T5 on the horizontal stabilizer (AFMS - 800XP), Part 6).

C. Close up

(1) Make sure the work area is clean and clear of tools and miscellaneous equipment.


A
B
INLET CONNECTION
OUTLET PIPES TO LEFT SIDE DISTRIBUTOR PANELS
BOLT (2)
OUTLET CONNECTION
PROPORTIONING UNIT
VIEW LOOKING AFT
OUTLET PIPES TO RIGHT SIDE DISTRIBUTOR PANELS
A HORIZONTAL STABILIZER PROPORTIONING UNIT
PIPES TO OUTER PANELS
PANEL W338
BOLT (2)
PIPES TO INBOARD DISTRIBUTOR PANELS AND STALL TRIGGER
LEADING EDGE RIB 5B
FORWARD
VIEW FROM ABOVE
OUTLET CONNECTION PIPE NUT
INLET CONNECTION PIPE NUT
B WING PROPORTIONING UNIT
M2309

Proportioning units

Figure 401

DE-ICING FLUID TANK - MAINTENANCE PRACTICES

1. Unit servicing

A. Drain de-icing fluid tank

(1) Place a suitable fluid container at a convenient position outside the airplane.

(2) Lead the nylon drain tube, on the pump drain, to the fluid container.

(3) Remove the blanking plug from the drain tube. Drain the de-icing fluid tank.

(4) Install the blanking plug and re-stow the drain tube. Make sure the drain tube is clear of the door linkage.

2. Removal/Installation

A. Removal

(1) Drain the tank (Paragraph 1.A.).

(2) On panel DA/D open, safety and tag circuit breaker TKS FLUID QTY (Chapter 24, ELECTRICAL POWER).

(3) Remove the crew cabinet (Maintenance Manual Addenda (MMA), Chapter 25, CREW CABINET).

(4) Remove the signal summing units (SSUs) from their rack (Chapter 27, SIGNAL SUMMING UNITS - REMOVAL/INSTALLATION).

(5) Disconnect the tank bonding cable and the SSU rack bonding cable from their common attachment point on the structure. Make sure the bonding cables are not damaged.

(6) Note the position of the attaching parts and remove the bolts, washers and distances pieces which attach the SSU rack to the tank platform. Remove the SSU mounting rack.

(7) Disconnect the pipe clip and separate the main rising vent pipe and the tank filler pipe from the tank.

(8) Disconnect the pipe nut and separate the manual vent valve pipe from the tank, discard the O-ring seal.

(9) Disconnect the pipe nut and separate the secondary vent pipe from the forward face of the tank, discard the O-ring seal.

(10) Disconnect the pipe nuts and separate the two pump supply pipes from the bottom of the tank, discard the O-ring seals.

(11) Disconnect the electrical wiring from the tank contents transmitter at terminal block PU.

(12) Remove the two front tank attachment bolts and tab washers, discard the tab washers.

(13) Remove the two rear tank attachment bolts, support washers and tab washers, discard the tab washers.

(14) Remove the tank rearward from the tank platform.

(15) Install blanks to the openings in the tank and to the open pipe ends.

(16) Remove any spilt de-icing fluid and make sure there is no corrosion in the vicinity of the tank.

B. Installation

(1) Remove the blanks from the openings in the tank and the installed pipe ends.

(2) Make sure the two outboard pipe connections on the tank sump are fitted with blanks and wire-locked.

(3) Position the tank on the tank platform.

(4) Install the two rear tank attachment bolts, support washers and lock with new tab washers.

(5) Install the two front tank attachment bolts and lock with new tab washers.

(6) Connect the electrical wiring for the tank contents transmitter to terminal block PU.

(7) Install the SSU mounting rack on the tank platform.

(8) Make sure there is a minimum clearance of 0.25 in. between the tank and the SSU rack.

(9) Connect the tank bonding cable and the SSU rack bonding cable to their common attachment point on the structure.

(10) Do a bonding test between the tank and the airplane structure, make sure the resistance is 50 milliohms or less (Chapter 20, ELECTRICAL BONDING).

(11) Do a bonding test between the SSU rack and the airplane structure, make sure the resistance is 50 milliohms or less (Chapter 20, ELECTRICAL BONDING).

(12) Install new O-ring seals, make sure the pipe olives are in position and connect the two pump supply pipes to the bottom of the tank.

(13) Install a new O-ring seal, make sure the pipe olive is in position and connect the manual vent valve pipe to the tank.

(14) Install a new O-ring seal, make sure the pipe olive is in position and connect the secondary vent pipe to the forward face of the tank.

(15) Wire-lock all connections.

(16) Make sure the pipe tape on the flexible pipe is serviceable and connect the main rising vent pipe and the tank filler to the tank with the pipe clip.

(17) On panel DA/D close circuit breaker TKS FLUID QTY (Chapter 24, ELECTRICAL POWER).

(18) Fill the tank (Chapter 12, ICE AND RAIIN PROTECTION).

(19) Prime and purge the system (Chapter 12, ICE AND RAIIN PROTECTION).

(20) Make sure the tank and the tank connections have no leaks.

(21) Do a functional test of the system (AIRFRAME ICE PROTECTION SYSTEM).

(22) Install the SSUs into their rack (Chapter 27, SIGNAL SUMMING UNIT).

(23) Install the crew cabinet (MMA, CREW CABINET).

(24) Fill the tank (Chapter 12, ICE AND RAIN PROTECTION).

(25) Do a function test of the entry door locking mechanism and make sure no part of the mechanism is fouling on any part of the structure or the crew cabinet.

C. Close up

(1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

ICE AND RAIN PROTECTION
AIRFOIL
DE-ICING PUMP
REMOVAL/INSTALLATION

30-10-43

400400

1. INFORMATION

Equipment/Materials	Part/Item No.
Lint free cloth	Local supply
Degreasing agent	230 (Ref. AMM 125/H-20, 20-95-201)
Wire, corrosion resistant	651 (Ref. AMM 125/H-20, 20-95-601)

2. DE-ICING PUMP

A. Removal

	MECH	INSP
(1) On panel DA/D open circuit breaker WING/TAIL ANTICE PUMP.		
(2) Remove access panel from bottom of crew cabinet forward bulkhead.		
(3) Drain storage tank (Ref. 30-10-35, 201).		
(4) Disconnect pump electrical leads from terminal block PU, and bonding lead from pump.		
(5) Unlock and disconnect inlet, outlet, vent and drain pipes from pump. Discard O-rings. Install blanks to disconnected pipes.		
(6) Remove attachment bolt from each of the 3 pump mounting bracket anti-vibration mounts and withdraw pump/bracket assembly. **NOTE** If pump is not being reinstalled, inhibit with oil.		

B. Installation

CAUTION: *Dry running of the pump is not permissible.*

	MECH	INSP
(1) Install pump/bracket assembly and secure with bolts removed at paragraph 2.A. (6).		
(2) Using new O-ring seals, connect inlet, outlet, vent and drain to pump (Ref. AMM 125/H-20, 20-10-11, 201).		
(3) Connect pump flying leads to terminal block PU, and bonding lead to pump.		

	MECH	INSP
(4) Fill de-icing tank and bleed any air from the pump (Ref. 12-30-00, 301). Check all pump connections for leaks.		
(5) Close circuit breaker WING/TAIL ANTICE PUMP.		
(6) Prime and functionally test the airframe ice protection system (Ref. 30-10-00, 501).		
(7) Lock pipe connections with wire (Item 651).		
(8) Install access panel to crew cabinet forward bulkhead.		

3. SUCTION FILTER

A. Removal

	MECH	INSP
(1) On panel DA/D open circuit breaker WING/TAIL ANTICE PUMP.		
(2) Remove access panel from bottom of forward vestibule cabinet.		
(3) Drain storage tank (Ref. 30-10-35, 201).		
(4) Unlock and disconnect both suction inlet pipes to the filter housings (Ref. Figure 401).		
(5) Unlock, remove and retain four bolts and plain washers securing both filter housings to the pump body.		
(6) Separate the filter housing and remove and discard the filter and both sealing O-rings.		

B. Installation

	MECH	INSP
(1) Clean both filter housings and the end faces of the pump body (Ref. Figure 401) using a lint free cloth wetted with a degreasing agent (Item 230).		
(2) Assemble new O-ring seal to both filter housings.		
(3) Insert new filter as shown and assemble both housings to pump body and secure assembly with retained bolts and plain washers. Lock the four bolts together with wire (Item 651).		
(4) Connect both suction pipes to their respective filter housings. Lock both pipe unions together with wire (Item 651).		
(5) Fill the tank (Ref. 12-30-00, 301), and make sure the indicator reads full.		
(6) On panel DA/D close circuit breaker WING/TAIL ANTICE PUMP.		

	MECH	INSP
(7) Prime and functionally test the airframe ice protection system (Ref. 30-10-00, 501).		
(8) Install access panel in vestibule cabinet.		

C. Close Up

	MECH	INSP
(1) Make sure the work area is clean and clear of tools and other equipment.		

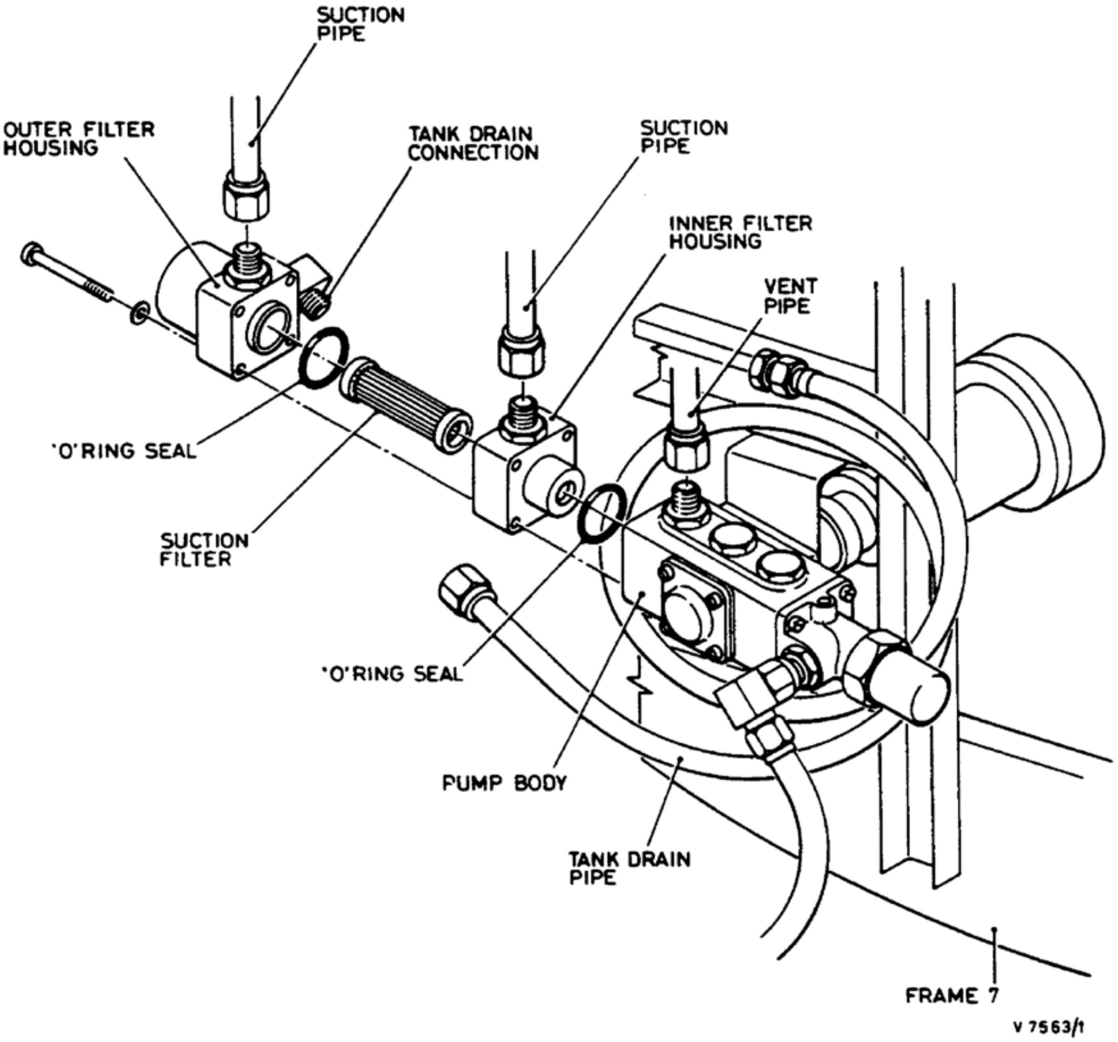


Figure 401
De-icing Pump Suction Filter Assembly

DE-ICING PUMP - INSPECTION/CHECK

1. Check de-icing pump

Equipment/Materials	Part/Item No.
Stopwatch.	Local supply
De-icing Fluid	101 (Chapter 20-95-101)

A. Procedure

(1) On panel DA/D open, safety and tag circuit breaker WING/TAIL ANTICE PUMP (Chapter 24, ELECTRICAL POWER).

(2) Remove de-icing pump/motor assembly (REMOVAL/INSTALLATION).

(3) Unscrew three commutator end-cap securing screws with washers and remove end-cap.

(4) Remove spade connectors from brush tags.

(5) Unscrew the brush retaining plugs and lift out the brushes.

(6) Measure brush lengths from shoulder to nearest point of commutator contact. If either brush is less than 0.25 inches long, both should be discarded and replaced with new items.

NOTE: Do not over-tighten brush retaining plugs.

(7) Insert serviceable brushes into guides and secure with brush retaining plugs.

(8) Install spade connectors to brush tags.

(9) Position commutator end-cap and secure with three screws and washers. Wirelock screws together.

(10) Install de-icing pump/motor assembly (REMOVAL/INSTALLATION). Fill the tank with de-icing fluid (Item 101) and make sure fluid temperature is greater than 0°C.

(11) Close the circuit breaker opened in paragraph A.(1) and energize d.c. busbars (Chapter 24, ELECTRICAL POWER).

(12) Select WING/TAIL ANTICE time switch to run for one minute to prime the system, and make sure de-icing fluid (Item 101) flows evenly along the full length of each distributor panel. If full flow distribution is not achieved, repeat the procedure until flow is even across the panels.

(13) When the time switch has run to zero, top-up the tank and note the fluid level in the neck of the tank.

(14) Select WING/TAIL ANTICE time switch to run for one minute and start the stopwatch simultaneously.

(15) When the time switch has run to zero, stop the stopwatch and make sure the quantity of fluid required to top-up the tank to the level noted in paragraph (13) is between 0.12 to 0.13 U.S.gals (0.10 to 0.11 Imp.gals. or 0.44 to 0.48 liters).

NOTE: *The quantities are for one minute of pump operation and should be adjusted for the actual running time recorded on the stopwatch.*

(16) Select WING/TAIL ANTICE time switch to run for eight minutes and start the stopwatch simultaneously.

(17) When the time switch has run to zero, stop the stopwatch and make sure the quantity of fluid required to top-up the tank to the level noted in paragraph (13) is 0.66 to 0.72 U.S.gals (0.55 to 0.60 Imp.gals or 2.51 to 2.71 liters).

NOTE: *These quantities are for eight minutes of pump operation and should be adjusted for the actual running time recorded on the stopwatch.*

(18) If flow rates are outside of the stated limits, check the following:

- Flow from all the distributor panels, as in paragraph (12).
- Condition of the suction filter (REMOVAL/INSTALLATION).
- Condition of the pressure filter (FILTER ASSEMBLY).

(19) Repeat paragraphs (12) to (18) inclusive.

(20) If the flow rate remains outside of the stated limit, the pump must be replaced with a serviceable unit.

(21) De-energize the d.c. busbars (Chapter 24, ELECTRICAL POWER).

(22) Wirelock the disturbed pipe connections.

B. Close up

(1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

ICE AND RAIN PROTECTION
AIRFOIL
FILTER ASSEMBLY
MAINTENANCE PRACTICES

1. UNIT SERVICING

A. Service Unit

	MECH	INSP
(1) On panel DA/E open circuit breaker WING ICE.		
(2) Remove access panel below filter bowl (Ref. Figure 201).		
(3) With a fluid container suitably positioned under filter assembly, unlock and unscrew filter center bolt. Remove filter bowl, with retaining spring and filter element. Discard sealing washers. **NOTE** The retaining spring and filter element may be held up on the center bolt; take care not to drop them.		
(4) Remove filter element and discard.		
(5) Thoroughly wash all components in hot water, using a soft brush.		
(6) Examine components for corrosion. Renew affected items.		
(7) Using new sealing washers and new filter element, reassemble unit. Make sure the spring is assembled with the smaller end nearest to the filter element.		
(8) Tighten and wirelock the center bolt. Install the access panel.		
(9) Close the circuit breaker WING ICE.		
(10) Fill the tank (Ref. 12-30-00, 301).		
(11) Prime and functionally test the system (Ref. 30-10-00, 501). Check for leaks at: • Seal ring between bowl and head casting. • Seal washer under head of center bolt. • Inlet and outlet connections.		

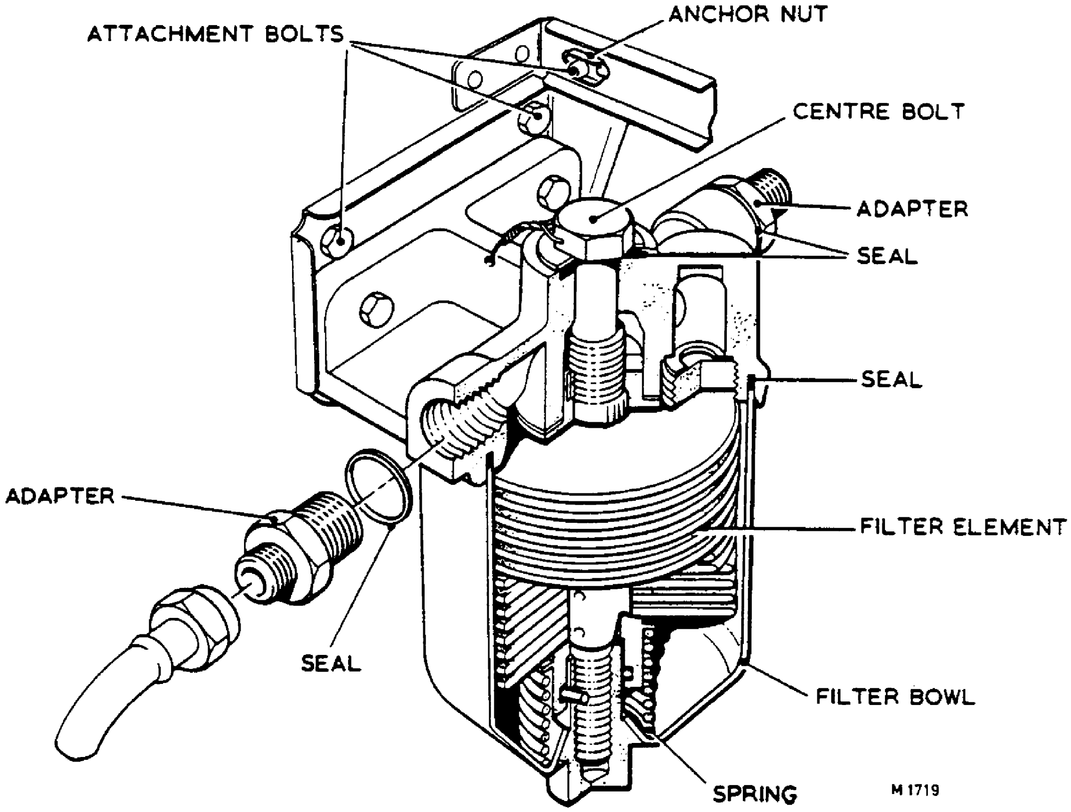


Figure 201
Filter Assembly

2. REMOVAL/INSTALLATION

A. Removal

	MECH	INSP
(1) On panel DA/E open circuit breaker WING ICE.		
(2) Drain the storage tank (Ref. 30-10-35, 201).		
(3) Place a suitable fluid container under the filter assembly.		
(4) Unlock and disconnect the inlet and outlet pipes. Discard the O-ring seals.		
(5) Remove the three attachment bolts and washers securing the adapter bracket to the support beam, and remove the filter assembly complete with adapter bracket.		

B. Installation

	MECH	INSP
(1) If a new filter assembly is to be installed, transfer the pipe adapters using new seals and the adapter bracket, to the new filter assembly.		
(2) Install the filter assembly. Tighten the attachment bolts.		
(3) Using new O-ring seals, connect the inlet pipe to the inlet adapter and outlet pipe to the outlet adapter (Ref. AMM 125/H-20, 20-10-11, 201).		
(4) Close circuit breaker WING ICE.		
(5) Fill the tank (Ref. 12-30-00, 301).		
(6) Prime and functionally test the system (Ref. 30-10-00, 501). Check for leaks. Wirelock the connections.		

C. Close Up

	MECH	INSP
(1) Make sure the work area is clean and clear of tools and other equipment.		

ICE AND RAIN PROTECTION
AIRFOIL

DISTRIBUTOR PANELS
SERVICING

1. INFORMATION

NOTE: The following procedure is to be used for servicing/cleaning on the wing/tail of only one TKS panel for each wing or tail section. If multiple panels on any one wing exhibit poor performance refer to flushing and priming procedure (Ref. 12-30-00, 301). If flushing procedures do not correct the problem then evaluate the performance of the indicated proportioning unit.

NOTE: The TKS distributor panels are to flow fluid evenly across the top and bottom of the panels. Some conditions which may cause uneven distribution of TKS fluid are as follows:

- Internal membrane damaged
- Contamination
- Air

If there is excessive flow from one area on any one of the TKS distributor panels remove and replace the affected panel before proceeding with the cleaning steps identified below.

CAUTION: *Applying air only to the TKS distributor panel will be detrimental as it will entrap air within the membrane and create areas where fluid cannot pass through.*

CAUTION: *Do not run the TKS pump with the TKS tank empty.*

Equipment/Materials	Part/Item No.
Fluid, de-icing	101 (Ref. AMM 125/H-20, 20-95-101)
Lint-free cloth	621 (Ref. AMM 125/H-20, 20-95-601)
Abrasive pad	637 (Ref. AMM 125/H-20, 20-95-601)

2. TKS PANEL CLEANING

A. Procedure

(1) Energize the airplane 28 Vd.c. busbars (Ref. 24-01-00, 201, Figure 201).

(2) Make sure the de-icing fluid tank is not less than half full.

(3) On the flight deck overhead panel rotate the WING/TAIL ANTICE switch to on for five (5) minutes.

(4) Using a lint free cloth (Item 621).

(a) Thoroughly wet the cloth with TKS fluid (Item 101).

(b) Wipe repeatedly on leading edge where evidence of TKS presence is lacking.

(c) If after wiping with the cloth no TKS flow is evident repeat the above procedure using a Scotch-Brite 350 grade pad (Item 637) rubbing in a spanwise direction.

(d) If no flow is evident after wiping with both a cloth and the Scotch-Brite pad continue to the next step.

(5) Rotate the WING/TAIL ANTICE switch to off.

(6) De-energize the airplane 28 Vd.c.busbars.

(7) On the affected side of the airplane, disconnect the nylon feed tube for the relevant distributor panel, from the wing or tail proportioning unit.

(8) Inspect the removed nylon tubing for evidence of damage, creases or blockage of TKS fluid.

(9) If damage to the tube is evident, replace the nylon tubing.

(10) Attach the flushing equipment (Ref. paragraph 3.) to the nylon tubing of the TKS distributor panel. With the pump on, make sure there is an air free supply of TKS fluid provided to the distributor panel. (It is possible to visualize bubbles within the nylon tube which leads to the TKS distributor panel).

(11) Using a lint free cloth (Item 621).

(a) Thoroughly wet the cloth (with TKS fluid (Item 101).

(b) For five (5) minutes wipe repeatedly on leading edge where evidence of TKS presence is lacking.

(c) If after wiping with the cloth no TKS flow is evident repeat the above procedure using a Scotch-Brite 350 grade pad (Item 637).

(d) If no flow is evident after wiping with both a cloth and the Scotch-Brite pad, replace the TKS distributor panel.

(12) Reconnect the nylon tubing to the proportioning unit and perform priming instructions (Ref. 12-30-00, 301).

(13) Rotate the WING/TAIL ANTICE switch to on and run the system with TKS fluid for five (5) minutes and check for even distribution of TKS fluid spanwise on both the upper and lower portion of the TKS distributor panel.

NOTE: At temperatures greater than 80°F (24°C) it may be necessary to use an external pressure source to maintain a minimum of at least 3 psi (0.21 bar).

(14) If an even distribution of TKS fluid from both upper and lower portion of the panel cannot be obtained then replace the affected TKS distributor panel.

3. FLUSHING EQUIPMENT

A. Construction

(1) The equipment required to construct the flushing equipment:

- A covered external TKS reservoir.
- A pump capable of a regulated 25 psi (1.72 bar) supply at a minimum of 0.5 gpm (1.89 lpm).

- Filter and housing part number FG903/91 or equivalent to be installed between the pump and the proportioning unit.
- Nylon tubing or equivalent tubing of sufficient length and diameter to connect the various components.
- Fittings appropriate for connecting to the required TKS supply tubing when disconnected from the proportioning unit.

NOTE: Obtain pump and attaching hardware locally.

(2) Connect a length of tubing between the TKS reservoir and the pump.

(3) Connect tubing from the pump to the filter inlet and from the filter outlet to the appropriate TKS panel feed tube.

4. CLOSE UP

A. Procedure

(1) Make sure that the work area is clean and clear of tools and miscellaneous equipment.

ICE AND RAIN PROTECTION
AIRFOIL
DISTRIBUTOR PANELS
REMOVAL/INSTALLATION

30-10-72

400400

1. INFORMATION

WARNING: The materials which are necessary to do this process can constitute a hazard or health risk if the applicable precautions are not taken. In all cases the material manufacturer's or supplier's health and safety data sheets must be referred to.

CAUTION: *After adjustment, replacement or Removal/Installation of two or more wing distributor panels on one side, or either of the one piece titanium leading edge sections or adjustment, replacement or Removal/Installation of either Stall Trigger, the airplane must be test flown, using Flight Manual Section 4.10, by a pilot familiar with the Stall Identification System and stall handling characteristics of the Series 800XP airplane, in order to check the stall characteristics. The Stall Identification System must be operative at all times.*

CAUTION: *It is important to record the accumulated details of any of the above actions on these panels, so that if a total of two or more wing distributor panels on one side, or either of the one piece titanium panels have been disturbed since the last stall system test flight, a new test flight will be done.*

CAUTION: *Distributor panels, other than the outboard titanium panels, are sprayed at their edges with a thin coating of Tygaflor (PTFE) or Rocol (IFL) to act as a release agent for the sealing material. When these panels are removed or installed make sure that the coating is not damaged.*

CAUTION: *After assembly of the distributor panel to the leading edge, make sure that the profile is smooth, continuous and free from high spots or depressions.*

CAUTION: *If a test flight is done and the stall characteristics are unacceptable, refer to Structural Repair Manual (SRM) 57-41-00, 201, do the necessary corrective actions and then do another test flight.*

NOTE: Procedure and technique for intentional stall demonstrations and for the identification and the characteristics of the stall are specified in the Flight Manual. Before a test flight, the Stall Identification System should be checked out on the ground in accordance with the requirements of the SRM 57-41-00, 201.

Equipment/Materials	Part/Item No.
Sealant	316 (Ref. AMM 125/H-20, 20-95-301)
Filler (Quick set (10 min))	301 (Ref. AMM 125/H-20, 20-95-301) 3M ‘Scotch Weld’ DP110 (color grey) ‘Epibond’ 1559
Filler (Longer set (45 min))	301 (Ref. AMM 125/H-20, 20-95-301) 3M ‘Scotch Weld’ 9323-2 B/A Araldite 2013

2. REMOVAL/INSTALLATION

A. General

If the outboard leading edge section of the wing is to be removed/installed or the stall trigger removed from its mounting distributor, refer to the SRM 57-41-00, 201 and AMM 57-40-05, 401.

B. Remove a Wing/Horizontal Stabilizer Distributor Panel

	MECH	INSP
(1) On panel DA-D, open and safety tag circuit breaker WING TAIL ANTICE PUMP (Ref. 24-01-00, 201).		
(2) Remove the distributor panel attachment screws. Remove, and hold the weight of the panel.		
(3) Put a suitable container under the entry connector, cut and remove the lockwire and disconnect the pipe coupling. Discard the sealing ring.		
(4) Install suitable blanks on the entry connector and the open pipe end.		

C. Install a Wing/Horizontal Stabilizer Distributor Panel

	MECH	INSP
(1) Carefully remove any unwanted gap filler compound from the leading edge.		
(2) Examine the distributor panel for signs of damage. Clean the panel (Ref. 30-10-72, 701).		
(3) Clean the unwanted sealant from the lap straps on the outer panels. Bed the lap straps on to new sealant (Item 316) (Ref. AMM 125/H-20, 20-10-1002, 201).		
(4) Put the distributor panel in position and hold the weight.		
(5) Remove the blanks and using a new sealing ring, connect the pipe coupling ((Ref. AMM 125/H-20, 20-10-11, 201).		
(6) On panel DA-D, remove the safety tag and close circuit breaker WING TAIL ANTICE PUMP (Ref. 24-01-00, 201).		
(7) Prime and do a functional test of the airframe anti-icing system (Ref. 30-10-00, 501).		
(8) Examine the pipe couplings for leaks.		
(9) Examine the PTFE tape along the mating surfaces. If damaged, renew the tape (Ref. 30-10-72, 801). Position and attach the distributor panel to the leading edge.		
(10) Tighten the attachment screws evenly.		

	MECH	INSP
CAUTION *After assembly of the distributor panel to the leading edge, make sure that the profile is smooth, continuous and free from high spots or depressions.* (11) Where visible, make sure the contour between the distributor panel and the leading edge is smooth and continuous chordwise and spanwise. Make sure the 'into/out of wind' dimensions are within the tolerances given (Ref. Figure 401). **NOTE** The 'into/out of wind' profile limits are to be adjusted by application of additional layers of PTFE tape, if necessary, to obtain the correct profile.		
(12) Use a correctly mixed filler and hardener (Item 301) to fill the gap between the distributor panel and the leading edge (Ref. Figure 401 or Figure 402).		
(13) Before a flight test, do a functional test of the stall identification system (Ref. 27-33-00, 501).		

D. Close Up

	MECH	INSP
(1) Make sure that the work area is clean and clear of tools and other equipment.		

E66950

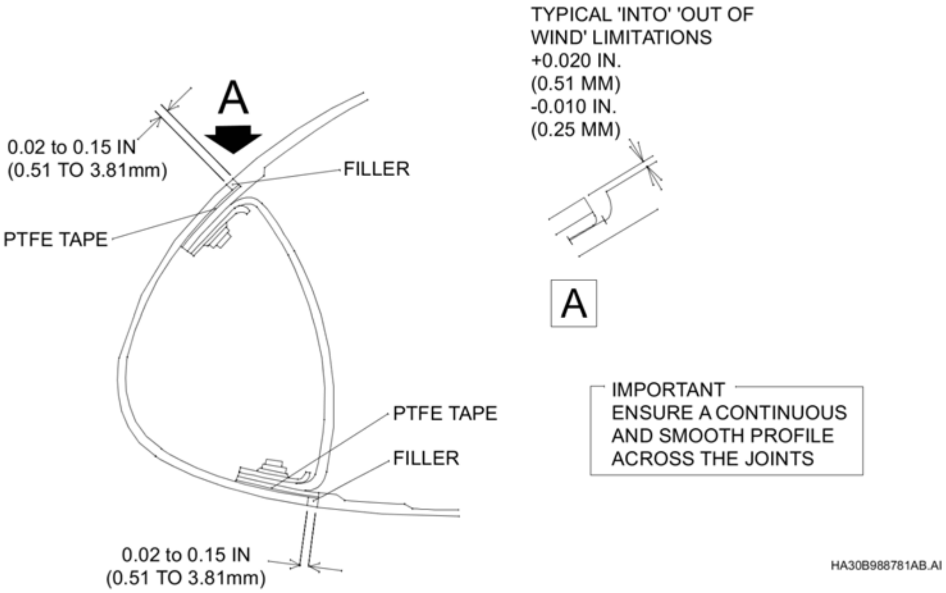


Figure 401
Distributor Panel Installation - Wings

E66949

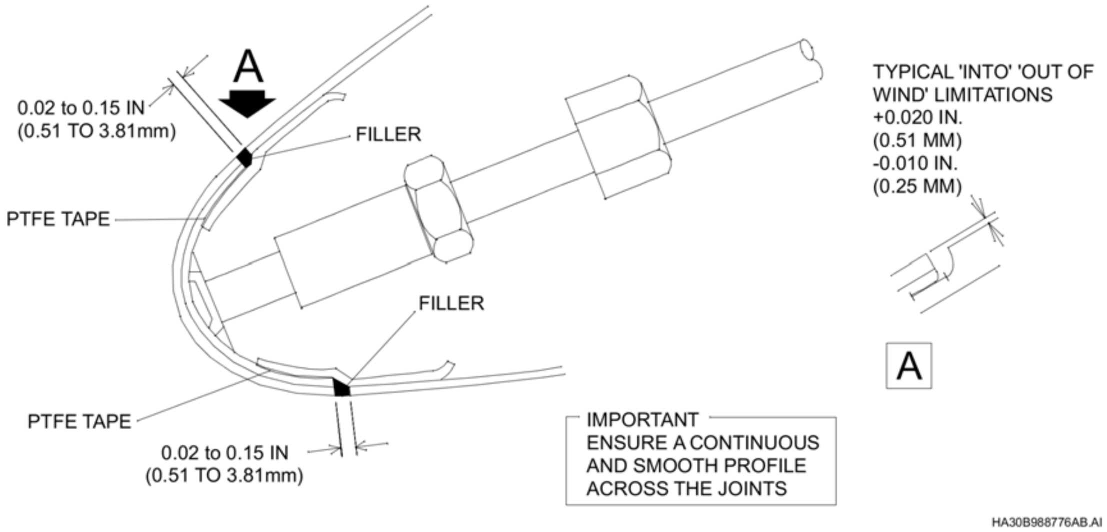


Figure 402
Distributor Panel Installation - Horizontal Stabilizer

DISTRIBUTOR PANELS - CLEANING/PAINTING

1. Wing distributor panels

WARNING: THE MATERIALS USED TO DO THIS PROCESS CAN BE HAZARDOUS, OR CONSTITUE A HEALTH RISK. THE MATERIAL MANUFACTURER'S OR SUPPLIER'S HEALTH AND SAFETY DATA SHEETS MUST BE REFERRED TO.

CAUTION: AFTER ADJUSTMENT, REPLACEMENT OR REMOVAL/INSTALLATION OF TWO OR MORE WING DISTRIBUTOR PANELS ON ONE SIDE, OR EITHER OF THE ONE PIECE TITANIUM LEADING EDGE SECTIONS, THE AIRPLANE MUST BE TEST FLOWN, USING FLIGHT MANUAL PROCEDURES, BY A PILOT FAMILIAR WITH THE STALL IDENTIFICATION SYSTEM AND STALL HANDLING CHARACTERISTICS OF THE SERIES 800XP AIRPLANE, IN ORDER TO CHECK THE STALL CHARACTERISTICS. THE STALL IDENTIFICATION SYSTEM MUST BE OPERATIVE AT ALL TIMES.

CAUTION: IT IS IMPORTANT TO RECORD THE ACCUMULATED DETAILS OF ANY OF THE ABOVE ACTIONS ON THESE PANELS, SO THAT IF A TOTAL OF TWO OR MORE WING DISTRIBUTOR PANELS ON ONE SIDE, OR EITHER OF THE ONE PIECE TITANIUM PANELS HAVE BEEN DISTURBED SINCE THE LAST STALL SYSTEM TEST FLIGHT, A NEW TEST FLIGHT WILL BE DONE.

CAUTION: DISTRIBUTOR PANELS, OTHER THAN THE OUTBOARD TITANIUM PANELS, ARE SPRAYED AT THEIR EDGES WITH A THIN COATING OF TYGAFLOR (PTFE) OR ROCOL (IFL) TO ACT AS A RELEASE AGENT FOR THE SEALING MATERIAL. WHEN THESE PANELS ARE REMOVED OR INSTALLED MAKE SURE THAT THE COATING IS NOT DAMAGED.

CAUTION: AFTER ASSEMBLY OF THE DISTRIBUTOR PANEL TO THE LEADING EDGE, MAKE SURE THAT THE PROFILE IS SMOOTH, CONTINUOUS AND FREE FROM HIGH SPOTS OR DEPRESSIONS.

CAUTION: IF A TEST FLIGHT IS DONE AND THE STALL CHARACTERISTICS ARE UNACCEPTABLE, REFER TO STRUCTURAL REPAIR MANUAL (SRM) 57-41-00, DO THE NECESSARY CORRECTIVE ACTIONS AND THEN DO ANOTHER TEST FLIGHT.

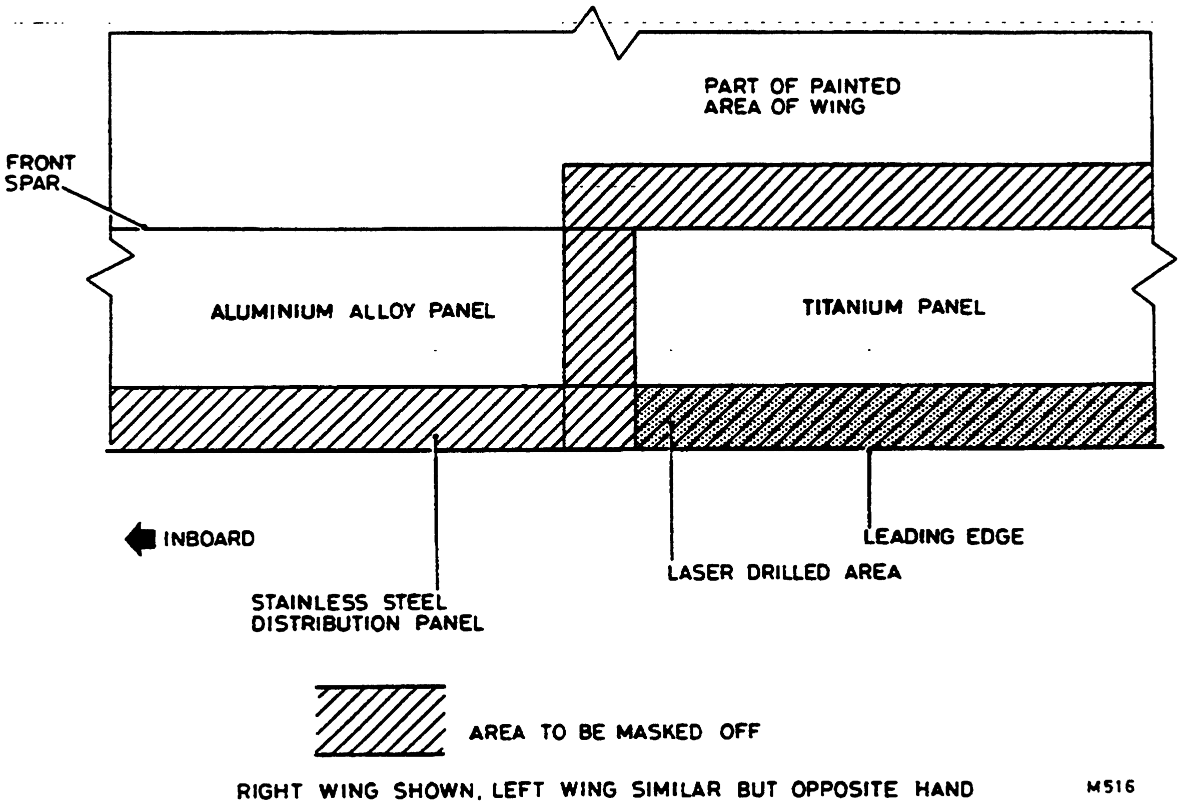
NOTE: Procedure and technique for intentional stall demonstrations and for identification and characteristics of the stall are specified in the Flight Manual. Before a test flight, the Stall Identification System should be checked out on the ground in accordance with the requirements of the Structural Repair Manual (SRM) 57-41-00.

2. Polishing wing titanium leading edge sections *(Figure 701)*

Equipment and Materials:

Equipment/Materials	Part/Item No.
Initial buffing composition	607 (Chapter 20-95-601)
Metal polish (final hand polish)	Fine metal polish
Mops (8 in. dia)	Ventilated Airflow
Masking tape (2 in. wide)	Melenex 200

(1) Use the approved masking tape, mask a continuous strip along the existing line of both the inboard and center distributor panels across the laser drilled area to keep the appearance of a straight line. Also, mask the end and rear of the titanium panels to make sure the adjacent aluminium alloy and painted areas are not affected by the polishing of the titanium panels.


PART OF PAINTED AREA OF WING
FRONT SPAR
ALUMINIUM ALLOY PANEL
TITANIUM PANEL
INBOARD
LEADING EDGE
LASER DRILLED AREA
STAINLESS STEEL DISTRIBUTION PANEL
AREA TO BE MASKED OFF
RIGHT WING SHOWN. LEFT WING SIMILAR BUT OPPOSITE HAND
M516

Masking of Titanium panels
Figure 701

NOTE: This process is applicable to both top and bottom skins.

WARNING: OPERATORS ARE TO WEAR A MASK DURING BUFFING OPERATIONS

CAUTION: THE USE OF ELECTRICALLY OPERATED POLISHING MACHINES IS PROHIBITED IN FLIGHT HANGERS. MECHANICAL BUFFING IS ACHIEVED BY USING A PNEUMATICALLY DRIVEN MACHINE REGULATED NOT TO EXCEED 1400 RPM.

CAUTION: POLISHING, BUFFING OR ABRASIVE COMPOUNDS ARE NOT PERMITTED ON POROUS AREAS OF THE PANELS, AS IRREVERSIBLE BLOCKAGE OF THE PERFORATIONS CAN RESULT.

(2) Polish the leading edge sections with a mop dressed with buffing composition (Item 607), at the same time make sure that:

- the mop is kept in motion when in contact with the skin.
- the Mop-to-skin pressure is to be kept to a minimum to prevent heat generation which could damage the leading edge distributor panel components.
- the buffing mop is used for short periods of time with intervals between operations to permit any generated heat to dissipate.
- frequent dressing of the mop with a hacksaw blade is done to prevent clogging. This could otherwise cause marking of the surfaces.
- different mops are used for different polishing compositions to make sure of a good finish.

(3) Final polishing is done by hand with a fine metal polish and clean soft cloths.

(4) Prime and do a functional test of the airframe de-icing system (AIRFRAME ICE PROTECTION SYSTEM) on completion of polishing to make sure of full, free and unobstructed flow of de-icing fluid.

3. Cleaning wing/horizontal stabiliser distributor panels

A. General

CAUTION: POROUS PANELS CONTAIN A PLASTIC MEMBRANE WHICH CAN BE DAMAGED BY SOME SOLVENTS, PARTICULARLY M.E.K., ACETONE, LACQUER THINNER AND SIMILAR SOLVENTS.

CAUTION: POROUS PANELS SHOULD BE MASKED WHEN PAINTING THE AIRPLANE OR WHILE SOLVENTS ARE BEING USED FOR ANY OTHER PURPOSE.

CAUTION: WHEN CLEANING OR POLISHING WING/HORIZONTAL STABILISER LEADING EDGES, BE CAREFUL NOT TO CONTAMINATE THE POROUS LEADING EDGE PANELS.

CAUTION: POLISHING, BUFFING OR ABRASIVE COMPOUNDS ARE NOT PERMITTED ON POROUS AREAS OF THE PANELS, AS IRREVERSIBLE BLOCKAGE OF THE PERFORATIONS CAN RESULT.

CAUTION: TO PREVENT DAMAGE TO THE PLASTIC POROUS MEMBRANE, ONLY USE THE APPROVED SOLVENTS.

Equipment and materials:

Equipment/Materials	Part/Item No.
Fluid, de-icing	101 (Chapter 20-95-101)
Detergent, liquid	205 (Chapter 20-95-201)
Isopropyl alcohol	206 (Chapter 20-95-201)
Methylated spirits	227 (Chapter 20-95-201)
Lint-free cloth	621 (Chapter 20-95-601)
Abrasive pad, fine grade (Scotchbrite)	637 (Chapter 20-95-601)

B. Clean the wing/horizontal stabiliser distributor panels

NOTE: The distributor panels can be removed from the airplane for cleaning. Refer to warnings given in paragraph 1.

NOTE: When cleaning or polishing the wing leading edges, make sure that the porous sections are not contaminated.

(1) Porous panels may be washed with soap (or detergent) and water, using a soft brush or lint-free cloths (Item 621). Only the following solvents are permitted for use on porous panels:

- Approved de-icing fluid (Item 101)
- Water, with liquid detergent (Item 205).
- Isopropyl alcohol (Item 206)
- Ethyl alcohol
- Industrial methylated spirits (Item 227)

(2) Cleaning porous panels is helped by priming the system before each flight, particularly when operating at low altitudes or insect infested areas.

(3) If cleaning with a detergent (Item 205 or an approved solvent) fails to remove surface deposits and stains, these can be removed by using a mild scouring pad (Item 637), e.g. Scotchbrite 350 or an equivalent. The surface should be rubbed lightly in a chordwise direction to preserve the original satin finish.

(4) If distributor panels or titanium leading edge sections are removed from the airplane for cleaning, dry by blowing clean compressed air at 15 to 30 p.s.i. through the entry connector.

DISTRIBUTOR PANELS - APPROVED REPAIRS

1. Wing distributor panels

WARNING: **THE MATERIALS WHICH ARE NECESSARY TO BE USED TO DO THIS PROCESS CAN CONSTITUTE A HAZARD OR HEALTH RISK IF THE APPLICABLE PRECAUTIONS ARE NOT TAKEN. IN ALL CASES THE MATERIAL MANUFACTURER'S OR SUPPLIER'S HEALTH AND SAFETY DATA SHEETS MUST BE REFERRED TO.**

CAUTION: **AFTER ADJUSTMENT, REPLACEMENT OR REMOVAL/INSTALLATION OF TWO OR MORE WING DISTRIBUTOR PANELS ON ONE SIDE, OR EITHER OF THE ONE PIECE TITANIUM LEADING EDGE SECTIONS, THE AIRPLANE MUST BE TEST FLOWN, USING FLIGHT MANUAL PROCEDURES, BY A PILOT FAMILIAR WITH THE STALL IDENTIFICATION SYSTEM AND STALL HANDLING CHARACTERISTICS OF THE SERIES 800XP AIRPLANE, IN ORDER TO CHECK THE STALL CHARACTERISTICS. THE STALL IDENTIFICATION SYSTEM MUST BE OPERATIVE AT ALL TIMES.**

CAUTION: **IT IS IMPORTANT TO RECORD THE ACCUMULATED DETAILS OF ANY OF THE ABOVE ACTIONS ON THESE PANELS, SO THAT IF A TOTAL OF TWO OR MORE WING DISTRIBUTOR PANELS ON ONE SIDE, OR EITHER OF THE ONE PIECE TITANIUM PANELS HAVE BEEN DISTURBED SINCE THE LAST STALL SYSTEM TEST FLIGHT, A NEW TEST FLIGHT WILL BE DONE.**

CAUTION: **DISTRIBUTOR PANELS, OTHER THAN THE OUTBOARD TITANIUM PANELS, ARE SPRAYED AT THEIR EDGES WITH A THIN COATING OF TYGAFLOR (PTFE) OR ROCOL (IFL) TO ACT AS A RELEASE AGENT FOR THE SEALING MATERIAL. WHEN THESE PANELS ARE REMOVED OR INSTALLED MAKE SURE THAT THE COATING IS NOT DAMAGED.**

CAUTION: **AFTER ASSEMBLY OF THE DISTRIBUTOR PANEL TO THE LEADING EDGE, MAKE SURE THAT THE PROFILE IS SMOOTH, CONTINUOUS AND FREE FROM HIGH SPOTS OR DEPRESSIONS.**

CAUTION: **IF A TEST FLIGHT IS DONE AND THE STALL CHARACTERISTICS ARE UNACCEPTABLE, REFER TO STRUCTURAL REPAIR MANUAL (SRM) 57-41-00, DO THE NECESSARY CORRECTIVE ACTIONS AND THEN DO ANOTHER TEST FLIGHT.**

NOTE: Procedure and technique for intentional stall demonstrations and for identification and characteristics of the stall are specified in the Flight Manual. Before a test flight, the Stall Identification System should be checked out on the ground in accordance with the requirements of the Structural Repair Manual (SRM) 57-41-00.

2. Apply new PTFE tape on the distributor panel mating surface

A. Procedure

Equipment and materials:

Equipment/Material	Part/Item No.
Contact cement	304 (Chapter 20-95-301)
Tape, PTFE 0.152 mm thick (Supplier U.K.30 & N.A.17 Ref. 20-95-00)	3M product No. 5451
Tape, PTFE 0.23mm thick (Supplier U.K.30 & N.A.17 Ref. 20-95-00)	3M product No. 5453

(1) Remove the unserviceable tape and clean off the old adhesive.

(2) Use layers of PTFE tape to align the contour of the distributor panel with the outside skin surface. Use contact cement (Item 304) to attach the layers of PTFE tape to the structure landing strip, and to each other. The contour of the distributor panel and the outside skin surface is to be aligned to within 0.02 in. (0.5 mm).

(3) Cut off the ends of the PTFE tape.

PITOT/STATIC DE-ICING SYSTEM - DESCRIPTION AND OPERATION

1. Description

Both pitot heads and their masts and the two front static plates are electrically heated. The L and R PITOT/VANE HEAT ON/OFF switches control the d.c. supply to the heating elements in each pitot head and its mast, but the static plates are switched by the R switch only and the weight-on-wheels relay. An ammeter, selector switch and two current level detectors are connected into the heater circuit to provide indication that the equipment is functioning satisfactorily.

Pre-Mod.25F924A airplanes:

Control switches, ammeter, current selector switch and PITOT HTR FAIL and L and R VANE HTR FAIL annunciators are located on the ICE PROTECTION section of the flight compartment roof panel CG. The two current level detectors are located in DA panel H.

The amber twin filament annunciators come on if the current through either head or mast heater is below a current loading of 0.7 ±0.3 amp. The annunciator is energized from busbar PE and is unswitched, therefore the indication is valid whenever the airplane power is switched on. The light is dimmed when the navigation light switch, on panel CG, is set to ON.

Mod.25F924A airplanes:

Control switches, ammeter, current selector switch, L and R PITOT HTR FAIL and L and R VANE HTR FAIL annunciators are located on the ICE PROTECTION section of the flight compartment roof panel CG. The two current level detectors are located in panel DA sub-panel B.

The amber twin filament annunciator for each side comes on if the current through the head or mast heater is below a current loading of 0.7 ±0.3 amp. The annunciators are energized from busbar PE and are unswitched, therefore the indications are valid whenever the airplane power is switched on. The lights are dimmed when the navigation light switch, on panel CG, is set to ON.

2. Operation

Pre-Mod.25F924A airplanes:

Normal control of the pitot head heaters is by operation of the ON/OFF switches on roof panel CG. Should either switch remain in the OFF position, the absence of current through the related heater element will operate the corresponding current level detector and subsequently the annunciator comes on. Should the fault condition be other than an incorrect switch position, the defective pitot head can be identified by use of the PITOT AMPS ammeter and adjacent L/R selector switch.

The serviceability of the PITOT HTR FAIL indicator filament is checked by operating a FLT ANNUNCIATORS TEST switch on the center instrument panel CC.

Mod.25F924A airplanes:

Normal control of the pitot head heaters is by operation of the two ON/OFF switches on roof panel CG. Should either switch remain in the OFF position, the absence of current through the related heater element will operate the related current level detector and subsequently the L or R annunciator comes on. When a fault occurs, the defective pitot head can now be identified by L or R "PITOT HTR Fail" lights, as well as, the PITOT Amps ammeter and adjacent selector switch. The L or R annunciator also comes ON.

PITOT/STATIC HEATERS - ADJUSTMENT/TEST

1. Functional test of the pitot head and front static plate heaters

CAUTION: TO OBTAIN MAXIMUM LIFE FROM THE HEATING ELEMENTS THE HEATERS SHOULD NOT BE SWITCHED ON IN STILL AIR FOR LONGER THAN 5 MINUTES.

CAUTION: MAKE SURE THE PITOT HEAD COVERS AND FRONT STATIC PLATE BLANKS ARE REMOVED BEFORE THE HEATER ELEMENTS ARE ENERGIZED.

A. Procedure

(1) Remove the pitot head covers.

(2) Energize PE and PS2 busbars (Chapter 24, ELECTRICAL POWER).

Pre-Mod.25F924A airplanes

(3) Make sure the PITOT HTR FAIL annunciator comes ON.

(4) Set L and R PITOT VANE HEAT switches to ON. After one minute, make sure the pitot ammeter reads 5.0 to 10.0 amp at each position of selector switch and make sure the annunciator goes OFF.

(5) Set the ammeter switch to R and switch OFF the right pitot head heater. Make sure the failure annunciator PITOT HTR FAIL comes ON as the ammeter reading drops to between 1 and 0.5 amp.

(6) Set the R PITOT/VANE HEAT switch to ON and make sure the PITOT HEAT FAIL annunciator goes OFF and the ammeter reading increases.

(7) Set the ammeter switch to L and switch OFF the left pitot head heater. Make sure the failure annunciator PITOT HTR FAIL comes ON as the ammeter reading drops to between 1 and 0.5 amp.

(8) Set the L and R PITOT VANE HEAT switches to OFF.

Mod.25F924A airplanes

(9) Make sure the L and R PITOT HTR FAIL annunciators come ON.

(10) Set L and R PITOT VANE HEAT switches to ON. After one minute, make sure the pitot ammeter reads 5.0 to 10.0 amp at each position of selector switch and make sure both the annunciators go OFF.

(11) Set the ammeter switch to R and switch OFF the right pitot head. Make sure the failure annunciator R PITOT HTR FAIL comes ON as the ammeter reading drops to between 1 and 0.5 amp.

(12) Set the ammeter switch to L and switch OFF the left pitot head. Make sure the failure annunciator L PITOT HTR FAIL comes ON as the ammeter reading drops to between 1 and 0.5 amp.

(13) Set the R PITOT VANE HEAT switches to OFF.

All airplanes

(14) Remove the front static plate blanks.

(15) Set the R PITOT VANE HEAT switch to ON.

(16) Press the left lever lock (weight on wheels) microswitch and make sure the left and right front static plates warm up. Release the microswitch.

*NOTE: Static plate current **cannot** be monitored on pitot ammeter.*

(17) Set R PITOT HEAT switch to OFF.

(18) De-energize the airplane busbars (Chapter 24, ELECTRICAL POWER).

(19) When the pitot heads and front static plates have cooled, install the pitot head covers and the front static plate blanks.

ICE AND RAIN PROTECTION
WINDOWS, WINDSCREENS AND DOORS
WINDSCREEN ELECTRICAL DE-ICING SYSTEM
DESCRIPTION AND OPERATION

1. GENERAL

An electrical heating system is provided to prevent ice formation on the front four windscreen panels (left and right center identified 'A' and adjacent left and right side identified 'B').

Power is supplied by ALTERNATORS (a.c. generators - one per engine) each of which can deliver 200 volts, 3 phase a.c., 7.4 kVA max. (Ref. 24-22-02). Either can supply both 'A' screens or one 'A' screen and one 'B' screen.

Controls and indicators for the system are located as shown (Ref. Figure 1). An electrical schematic diagram is provided (Ref. Figure 2).

For troubleshooting the windscreen controllers refer to the Vendor Manual.

2. DESCRIPTION

The heated windscreen panels are made from acrylic laminates with electrically conductive transparent film coatings (heating elements) on the inner faces of the outside plies.

The coating of each panel is in three sections (separated by narrow isolation gaps) with busbars at top and bottom edges. Connection is in delta format for the 'A' screens and star format for the 'B' screens.

Three temperature sensors (thermistors) are incorporated in each heated panel and provide one 'normal' and two 'overheat' signals for the related controller.

Each controller (one per heated panel) regulates panel temperature by cycling relays which switch power to the associated screen.

A resistor is installed between terminals 9 and 10 of each screen "A" thermal controller. The resistors are installed on panel DA-G and improve the compatibility between the panel "A" thermal controllers and the solid state relay.

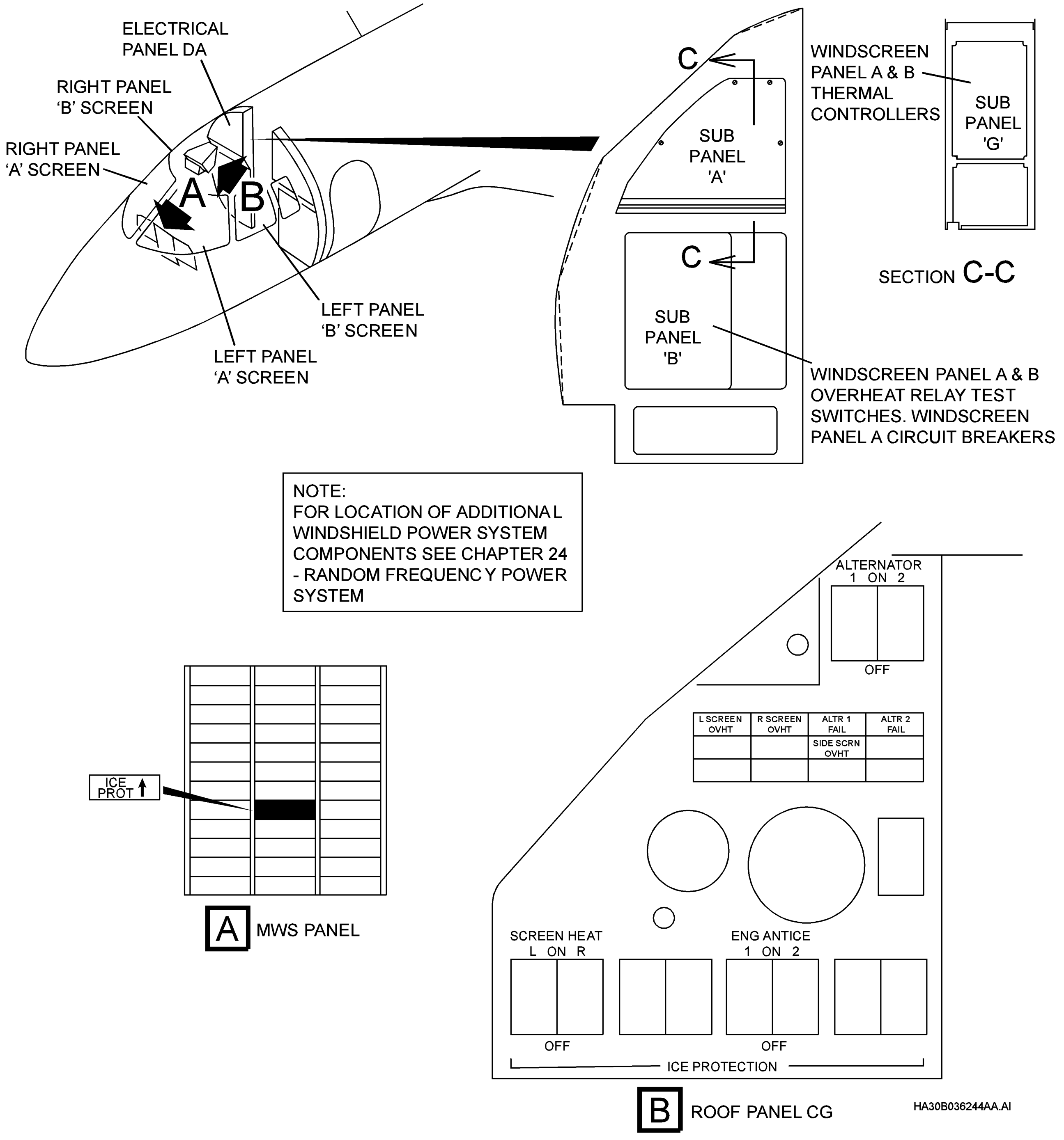
Filters suppress transients induced in the wiring by static discharges from the screens.

The resistor in the 'A' screen normal temperature sensing circuit is used, in conjunction with the temperature uplift relay, to vary the operating temperature datum of the screen.

Both temperature datums are lowered by using the temperature uplift relay to connect a resistor in parallel with the temperature sensor, giving a low temperature datum when the airplane is on the ground or in flight with both ENG ANTICE switches OFF. During flight with either ENG ANTICE switch ON the resistor will be disconnected by the temperature uplift relay, leaving the temperature sensor alone to control the temperature datum.

The overheat temperature datum is set by the resistors connected in series with the overheat temperature sensors.

Both 'normal' and 'overheat' control functions are available when a SCREEN HEAT switch is ON but, owing to the difference in temperature datums, the controller 'overheat' output is continuous, energizing 'overheat' relays, until 'normal' control fails. When 'overheat' control is exercised, the relevant controller provides a constant warning signal, with the related SCREEN OVHT annunciator and Master Warning System display panel ICE PROT coming ’ON’. This signal cannot be cancelled unless particular SCREEN HEAT switch is put to OFF or airplane busbars de-energized.



NOTE:
FOR LOCATION OF ADDITIONAL WINDSHIELD POWER SYSTEM COMPONENTS SEE CHAPTER 24 - RANDOM FREQUENCY POWER SYSTEM

Figure 1
Windscreen Electrical De-icing - Location of Components

Each panel controller has an associated O/HEAT TEST switch. The two switches for the 'A' screens are mounted above the ‘A’ screen W/S HEAT POWER LH and RH circuit breakers located on panel DA-B. The 'B' WINDOW test switches are mounted below the ‘A’ screen W/S HEAT POWER LH and RH circuit breakers located on panel DA-B. Each 2-pole switch has two positions, numbered 1 and 2 with spring return to center off. A resistor links the moving contacts of the switch and, in position 1 or 2, an overheat sensor is linked to ground via the resistor, simulating an overheat signal to the related controller to check the 'overheat' functions.

Solid state relays (one per phase) are used to control the 'normal' supply to each 'A' screen.

3. OPERATION

The engine ALTERNATORS are 115/200 volts, 3 phase machines with grounded neutral.

If output parameters are correct and the ALTERNATOR 1 and 2 switches are ON, the Generator Line Contactors (GLC's) 1 and 2 and the GLC Auxiliary Relays will be energized. Power is then available for both 'A' and both 'B' screens with ALTERNATOR 1 to feed Left 'A' and Right 'B' and ALTERNATOR 2 to feed Right 'A' and Left 'B'.

If only one ALTERNATOR is functioning, the de-energized GLC transfers its 'A' screen load to the operative ALTERNATOR and triggers its ALTR FAIL annunciator and thereby the Master Warning System ICE PROT. The de-energized GLC Auxiliary Relay releases the coil of 'Both generators on line relay' with consequent loss of 'B' screens controllers supplies and thus the loss of 'B' screens power.

When power is available, selecting SCREEN HEAT L and R switches to ON, activates the controllers which then energize the series connected 'normal' and 'overheat' relays and direct power via the filters to the screens.

When a screen temperature reaches its 'normal' upper limit, the associated controller 'normal' supply ceases, the 'normal' relays are de-energized and the screen power supply cut. The screen power supply is restored when the screen temperature drops to its 'normal' lower limit. The cycle is then repeated until relevant SCREEN HEAT switch is set to OFF.

If a 'normal' channel fails 'on' ('normal' relays energized) the increasing temperature of the screen controlled will cause the 'overheat' channel to assume control by cycling the 'overheat' relays.

NOTE: If an 'A' screen overheat fault is traced to a defective 'normal' control relay, all three relays should be checked for serviceability as, due to the three-phase delta connection of the screen, an overheat situation cannot arise until at least two relays are in the energized configuration.

High/low normal temperature datums are selected automatically by the temperature uplift relay, which is energized to give a low datum when the airplane is on the ground or both ENG ANTICE switches are OFF in flight.

When the temperature uplift relay is de-energized the screen temperature is maintained by the normal temperature sensor alone. With the relay energized a resistor is connected in parallel with the temperature sensor. The controller will 'see' a higher temperature than is actually present at the screen, and therefore the screen will be maintained at a lower temperature than provided by the temperature sensor alone.

NOTE: Loss of 'temperature uplift' relay energization supply, whether through switching or other open circuit condition, initiates high level heat control.

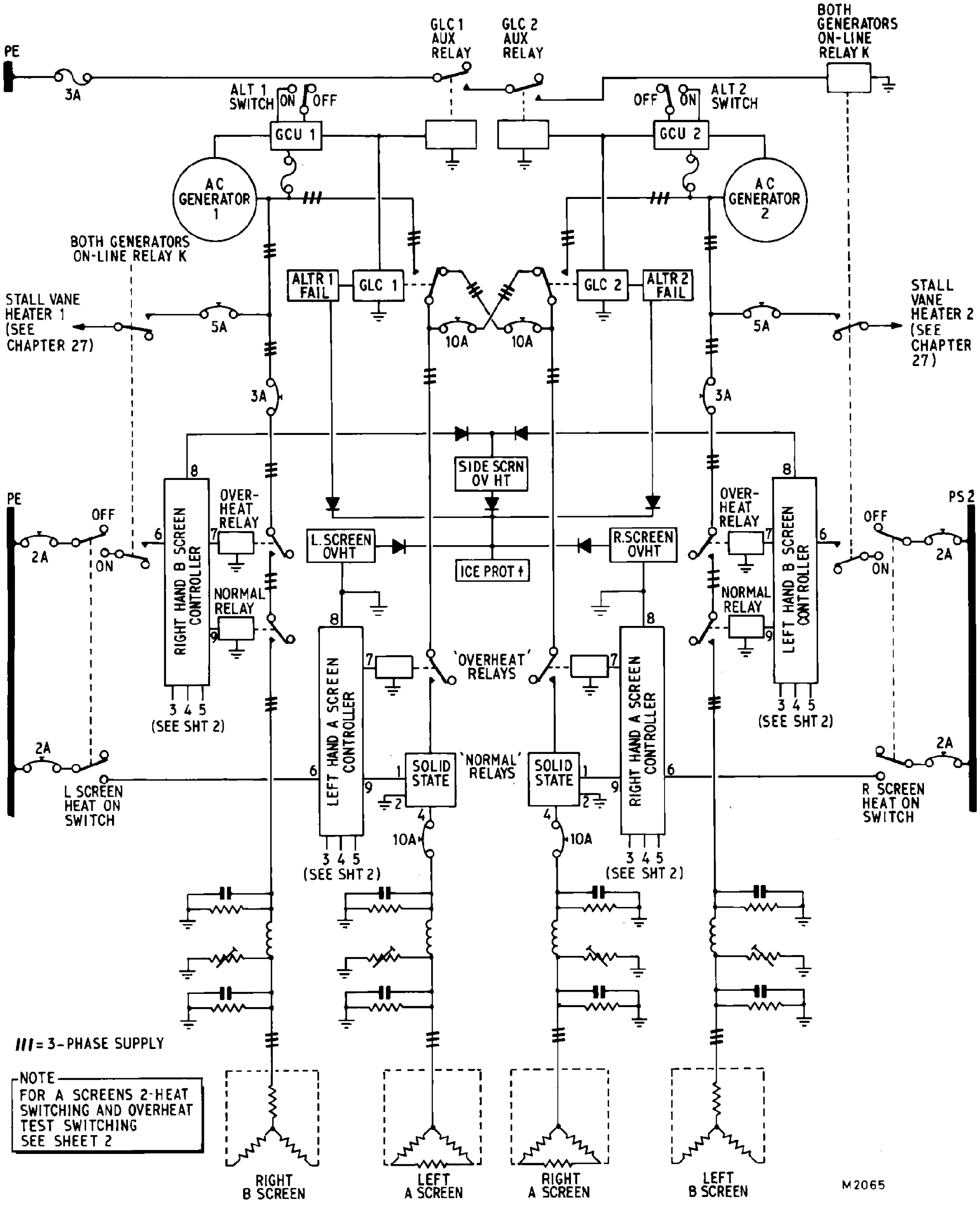


Figure 2 (Sheet 1 of 2)
Windscreen Anti-icing Schematic Wiring Diagram

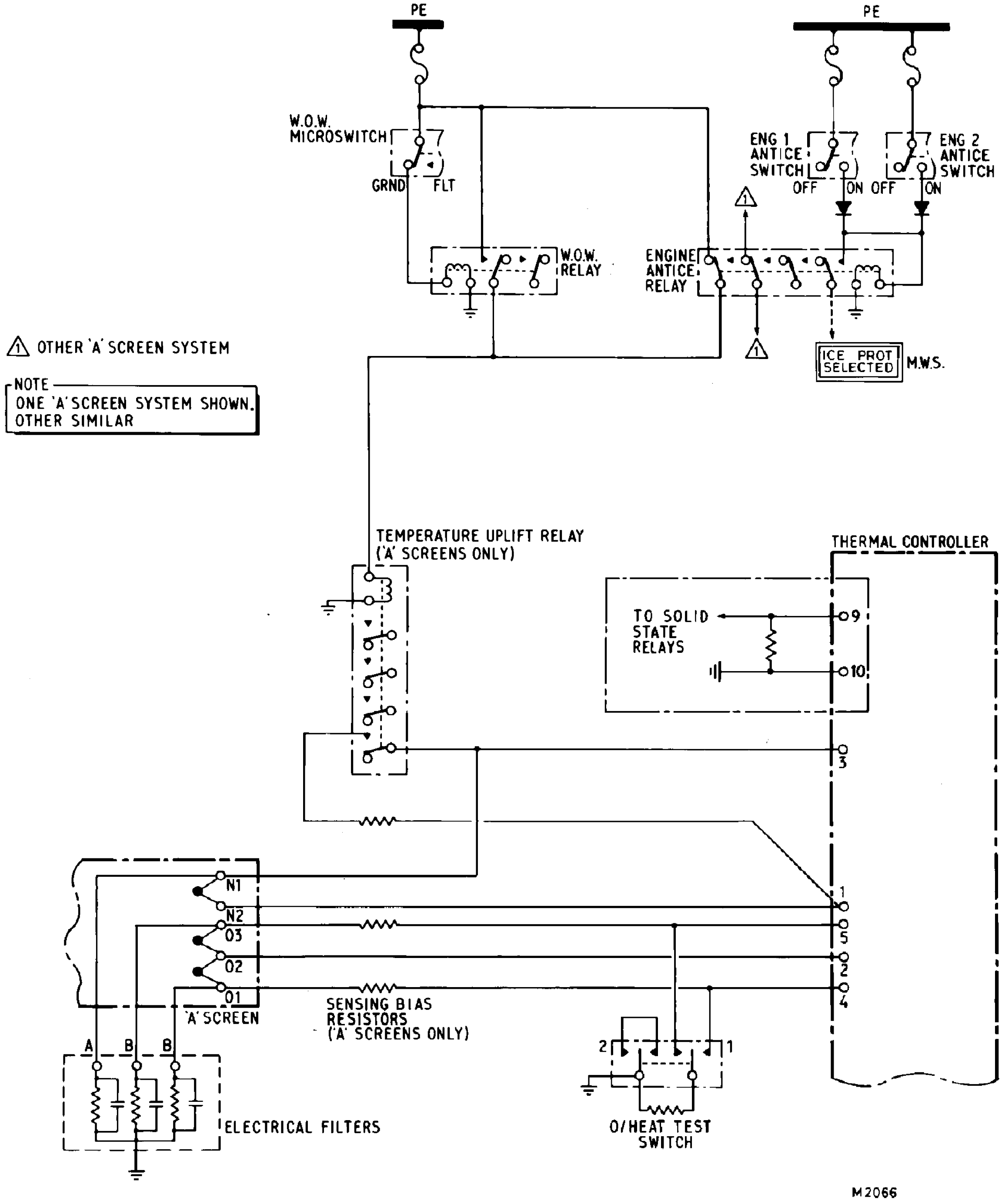


Figure 2 (Sheet 2 of 2)
Windscreen Anti-icing Schematic Wiring Diagram

WINDSHIELD ELECTRICAL DE-ICING SYSTEM - ADJUSTMENT/TEST

1. Operational check of windshield overheat

A. Procedure

(1) Energize d.c. busbars (Chapter 24, ELECTRICAL POWER)

(2) Start and run both engines (Chapter 71, POWER PLANT)

(3) Select ALTERNATOR switches to ON and make sure the ALTR FAIL annunciators go 'OFF'.

NOTE: Windshield heat operation should be kept to a minimum to prove system serviceability during ground testing.

(4) On roof panel CG, select SCREEN HEAT L and R switches to ON.

(5) On panel DA select 'A' SCRN (LH) test switch to O/HEAT 1 and make sure the L SCREEN OVHT annunciator and ICE PROT repeater annunciator come 'ON'. Release test switch.

(6) On panel CG, select SCREEN HEAT L switch to OFF, wait approximately 2 seconds and then select to ON. Make sure the L SCREEN OVHT annunciator goes 'OFF'.

(7) Select 'A' SCRN (LH) test switch to O/HEAT 2 and make sure the annunciators operate, as in paragraph (5). Release test switch and repeat paragraph (6) and make sure the L SCREEN OVHT annunciator goes 'OFF'.

(8) Repeat paragraphs (5) to (7) inclusive for 'A' SCRN (RH), reading R instead of L.

(9) On panel DA select 'B' SCRN (LH) test switch to O/HEAT 1 and make sure the SIDE SCRN OVHT annunciator and ICE PROT repeater annunciator come 'ON'. Release test switch.

(10) On panel CG, select SCREEN HEAT R switch to OFF, wait approx. 2 seconds and then set to ON. Make sure the SIDE SCRN OVHT annunciator goes 'OFF'.

(11) Select 'B' SCRN (LH) test switch to O/HEAT 2 and make sure the annunciators operate, as in paragraph (9). Release test switch and reset circuit as in paragraph (10).

(12) Repeat paragraphs (9) to (11) inclusive, using 'B' SCRN (RH) test switch and SCREEN HEAT L switch.

(13) Select SCREEN HEAT and ALTERNATOR switches to OFF.

(14) Stop engines (Chapter 71, POWER PLANT).

(15) De-energize d.c. busbars (Chapter 24, ELECTRICAL POWER).

2. Functional test of system

A. Procedure

(1) Gain access to the relevant windshield controller on panel DA/G by opening panel DA/A.

(2) Disconnect terminals 2,4 and 5 at the relevant controller.

CAUTION: DO NOT APPLY VOLTAGES IN EXCESS OF 3 VOLTS TO TEMPERATURE SENSING ELEMENTS.

(3) Connect an ohmmeter between the wire-ends removed from terminals 2 and 4, and 2 and 5 of the controller in turn, and make sure the circuit resistance is within the limits given in *Table 501* for the ambient temperature.

Overheat sensors - resistance/temperature

Table 501

Ambient temp. °C	Terminals 2 to 4 and 2 to 5 resistance - OHMS		Ambient temp. °C.	Terminals 2 to 4 and 2 to 5 resistance - OHMS	
	MAX.	MIN.		MAX.	MIN.
-10	22160	12970	+20	4980	3270
0	12970	7890	+30	3270	2230
+10	7890	4980	+40	2230	1580

(4) Reconnect wiring to terminals 2, 4 and 5 of the relevant controller.

(5) Repeat paragraphs (1) to (4) inclusive for other windshield temperature controller, if required.

(6) Energize d.c. busbars (Chapter 24, ELECTRICAL POWER).

(7) Start and run both engines (Chapter 71, POWER PLANT).

(8) Select the relevant SCREEN HEAT switch to ON, and make sure with a voltmeter that 28 volts d.c. is present at terminal 7 of the relevant controller to energize the overheat relay.

(9) Connect a 500 ohm 0.5 watt resistor across terminals 2 and 4 of the controller, and make sure the relevant SCREEN OVHT annunciator comes 'ON', the ICE PROT repeater annunciator flashes and the voltage on terminal 7 of the controller falls to zero.

(10) Remove the resistor, and make sure the annunciators remain 'ON' and the voltage on terminal 7 of the controller rises to 28 volts d.c.

(11) Select the relevant SCREEN HEAT switch to OFF, then ON, and make sure that both annunciators are 'OFF'.

(12) Repeat paragraphs (7) to (9) inclusive, connecting the resistor across terminals 2 and 5 to make sure the second overheat sensor.

(13) Select the SCREEN HEAT switch to OFF.

(14) Repeat paragraph (6) to (13) inclusive for other windshield temperature controllers, if required.

(15) Stop engines (Chapter 71, POWER PLANT).

NOTE: *Climatic conditions can result in windshield temperatures above the normal 'control' level (in which case the system will not supply heat) or so cold that rapid heat dissipation prevents the power supply bringing the windshield to the 'control' limiting temperature. The following paragraphs should only be carried out in suitable ambient conditions.*

(16) Connect a voltmeter, set to the relevant range, between the applicable test points in *Table 502*.

NOTE: *Both 'A' panels can be supplied from either a.c. generator, but each 'B' panel is only fed from its opposite a.c. generator (RH a.c. generator supplies LH 'B' panel, and vice-versa).*

Windshield heater voltages - test points

	Positive lead	Negative lead	Reading
LH panel A	DA-G K-9	DA-G K-10	28 volts d.c.
LH panel A	F2 PKA-1	DA-J TB-2R	115 volts a.c.
LH panel A	F2 PKA-2	DA-J TB-2R	115 volts a.c.
LH panel A	F2 PKA-3	DA-J TB-2R	115 volts a.c.
RH panel A	DA-G L-9	DA-G L-10	28 volts d.c.
RH panel A	F2 PLA-1	DA-J TB-2R	115 volts a.c.
RH panel A	F2 PLA-2	DA-J TB-2R	115 volts a.c.
RH panel A	F2 PLA-3	DA-J TB-2R	115 volts a.c.
LH panel B	DA-G J-9	DA-G J-10	28 volts d.c.
LH panel B	F2 PSA-1	F2 PSA-4	115 volts a.c.
LH panel B	F2 PSA-2	F2 PSA-4	115 volts a.c.
LH panel B	F2 PSA-3	F2 PSA-4	115 volts a.c.
RH panel B	DA-G N-9	DA-G N-10	28 volts d.c.
RH panel B	F2 PTA-1	F2 PTA-4	115 volts a.c.
RH panel B	F2 PTA-2	F2 PTA-4	115 volts a.c.
RH panel B	F2 PTA-3	F2 PTA-4	115 volts a.c.

(17) Start relevant engine (Chapter 71, POWER PLANT).

(18) Select relevant ALTERNATOR switch to ON and make sure the applicable ALTR FAIL annunciator goes 'OFF'.

NOTE: *Windshield heat operation should be kept to the minimum to prove system serviceability during ground testing.*

(19) Select the relevant SCREEN HEAT switch to ON, and make sure:

(a) The voltmeter indicates either 28 volts d.c. or 115 volts a.c. (depending on the chosen test point).

(b) When windshield temperature reaches its normal operating temperature (within approximately one minute, but dependant on ambient temperature) make sure the voltmeter indicates zero volts.

(c) When windshield temperature has dropped below its normal operating temperature (again, the time is dependant on ambient temperature) make sure the voltmeter indicates 28 volts d.c. or 115 volts a.c. (depending on the chosen test point).

(20) Select SCREEN HEAT and ALTERNATOR switches to OFF.

(21) Stop engine (Chapter 71, POWER PLANT).

(22) De-energize d.c. busbars (Chapter 24, ELECTRICAL POWER).

(23) Disconnect and remove voltmeter.

(24) Do a check of the security of all disturbed connections and close and secure all panels.

B. Close up

(1) Make sure the work area is clean and clear of tools and miscellaneous equipment.

ICE DETECTION SYSTEM - DESCRIPTION AND OPERATION

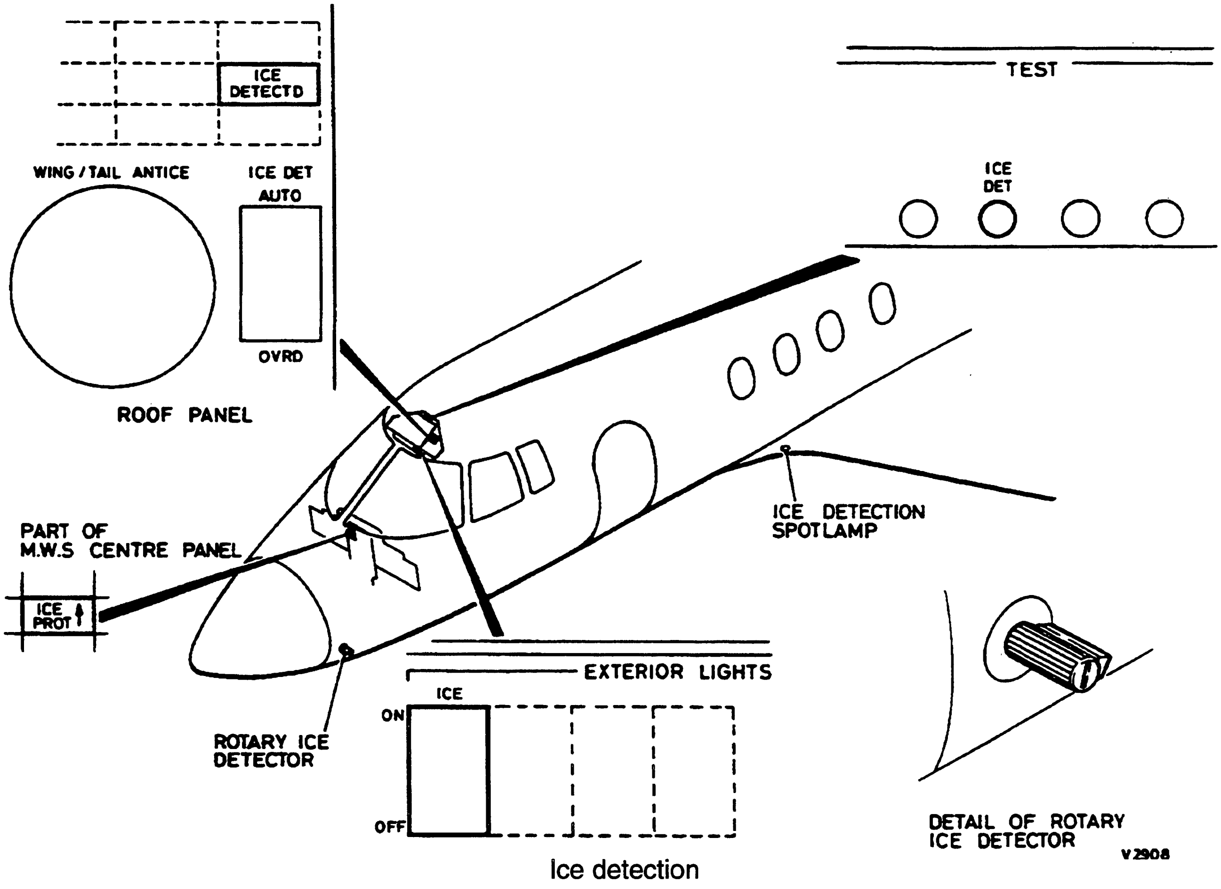
1. General

A rotary-cutter type ice detector, two warning annunciators and a wing spot-lamp are provided. The location of the equipment is given on *Figure 1*.

Formation of airframe ice is detected automatically after take-off. Manual selection of the detector is available for operation on the ground.

2. Location of controls and annunciators

Item	Location
ICE DETector AUTO-OVRD switch	Roof panel
ICE DETECTD annunciator	ICE PROTECTION
ICE spotlamp ON-OFF switch	Roof panel - EXTERIOR LIGHTS
ICE PROTection annunciator	MWS centre panel
ICE DET pushbutton	Roof panel - TEST



Ice detection
Figure 1

3. Rotary-cutter ice detector

The a.c. electrical power supplies to the ice detector are fed through the left landing gear lever lock circuit, and an ICE DET AUTO-OVRD switch connected in parallel.

With AUTO set, the detector commences to operate when the aircraft becomes airborne. Setting OVRD by-passes the lever-lock circuit so that the detector operates on the ground. The ice detection switch should be set to OVRD before taxying in icing conditions.

The ice detector unit consists of an a.c. powered motor driving a serrated rotor which rotates in close proximity to a fixed knife-edge cutter. When ice forms on the rotor the gap between the rotor and adjacent cutter is filled. The skimming action of the cutter against the ice causes a rise in motor torque which rotates the motor slightly within its mounting. Rotation of the motor actuates a microswitch which connects a d.c. power supply, via a time delay relay, and the ICE DETECTD annunciator comes on. The ice warning is repeated on the ICE PROT annunciator. If an ICE DET TEST pushbutton is pressed both annunciators come on.

The time delay relay maintains the ice warning signal during intermittent changes in motor torque. When ice ceases to form, a spring returns the motor to the normal position, the microswitch opens and after a delay of 60 seconds, the warning is cancelled.

4. Wing spotlamp

The spotlamp is controlled by an ICE ON-OFF switch, when selected to ON the spotlamp gives lighting to the left wing leading edge for night visual inspection.

5. Electrical power supplies

Power distribution to the equipment is as follows :

Equipment	Busbar
Rotary ice detector	XS2
Ice warning annunciator	PS2(a)
Wing inspection lamp	PS1(a)

ICE DETECTION SYSTEM - ADJUSTMENT/TEST

1. Function test ice detection system

Equipment/Materials	Part/Item No.
Torque test indicator	Napier WB.808//1680
Stop watch	Local supply

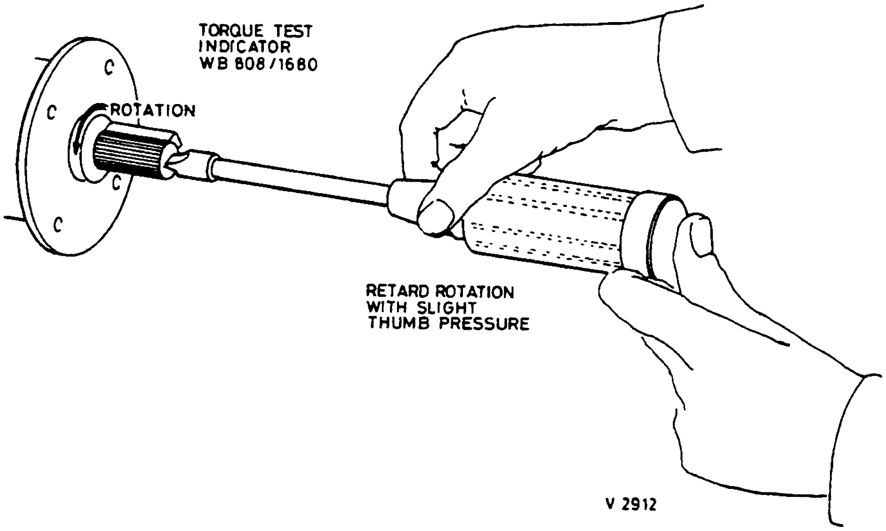
A. Procedure

ACTION		RESULT
(1) Energize a.c. and d.c. busbars (Chapter 24, ELECTRICAL POWER).	...	-
(2) At roof panel CG, press and hold ICE DET TEST button.	...	ICE DETECTD annunciator (roof panel) and ICE PROT repeater annunciator (MWS) come 'ON'.
(3) Release ICE DET TEST button.	...	Annunciators go 'OFF' after approximately 60 seconds.
(4) At roof panel CG, select ICE DET switch to OVRD.	...	Ice detector serrated shaft rotates in a counter clockwise direction when viewed from the detector head.

CAUTION: WHEN PERFORMING THE FOLLOWING OPERATION DO NOT CAUSE THE ICE DETECTOR MOTOR TO LABOUR.

ACTION		RESULT
(5) Refer to *Figure 501*. Insert blade of torque test indicator into slot on the face of the rotor and apply slight thumb pressure as detailed.	...	ICE DETECTD and ICE PROT repeater annunciators come 'ON'.
(6) Release and remove torque test indicator.	...	Same result as paragraph 3.
(7) At roof panel CG select ICE DET switch to AUTO.	...	Ice detector shaft ceases to rotate.

ACTION	RESULT
(8) Press and hold oleo microswitch (lower torque link, left main landing gear). ...	Ice detector shaft rotates in a counter clockwise direction.
(9) Release oleo microswitch. ...	Ice detector shaft ceases to rotate.
(10) De-energize a.c. and d.c. busbars. (Chapter 24, ELECTRICAL POWER)	


TORQUE TEST INDICATOR WB 808/1680
ROTATION
C
C
C
C
RETARD ROTATION WITH SLIGHT THUMB PRESSURE
V 2912

Ice detector torque test

Figure 501

ROTARY ICE DETECTOR - MAINTENANCE PRACTICES

1. Removal/Installation

CAUTION: DO NOT DISTURB EXTERNAL FIXING BOLTS, NUTS AND SCREWS, OR REMOVE SWITCH END COVER, OR THE ADJUSTMENT OF THE DETECTOR MAY BE SERIOUSLY AFFECTED.

A. Removal

(1) On panel DA, open both ice detector circuit breakers (Chapter 24, ELECTRICAL POWER).

(2) Disconnect electrical cables from detector.

(3) Remove securing nuts and withdraw detector.

B. Installation

CAUTION: DO NOT USE AN AIR JET TO CLEAR VENT HOLES IN ICE DETECTOR AS THIS WILL BLOW FOREIGN MATTER INWARD AND CAUSE DAMAGE TO THE MOTOR.

(1) Make sure that vent holes in ice detector and vent holes and drain hole in mounting assembly are clear. Position ice detector so that vent holes align with vent holes in mounting assembly. Install attachment nuts and tighten evenly.

(2) Do a check of the clearance between the rotor and skin (*Figure 201*)

(3) Connect the electrical cables to the terminal blocks.

(4) Close both the circuit breakers.

(5) Do a functional test of ice detection system (ICE DETECTION SYSTEM).

2. Bench test for rotary ice detector

Equipment/Materials	Part/Item No.
Torque test indicator	Napier WB.808/1680

A. Functional test

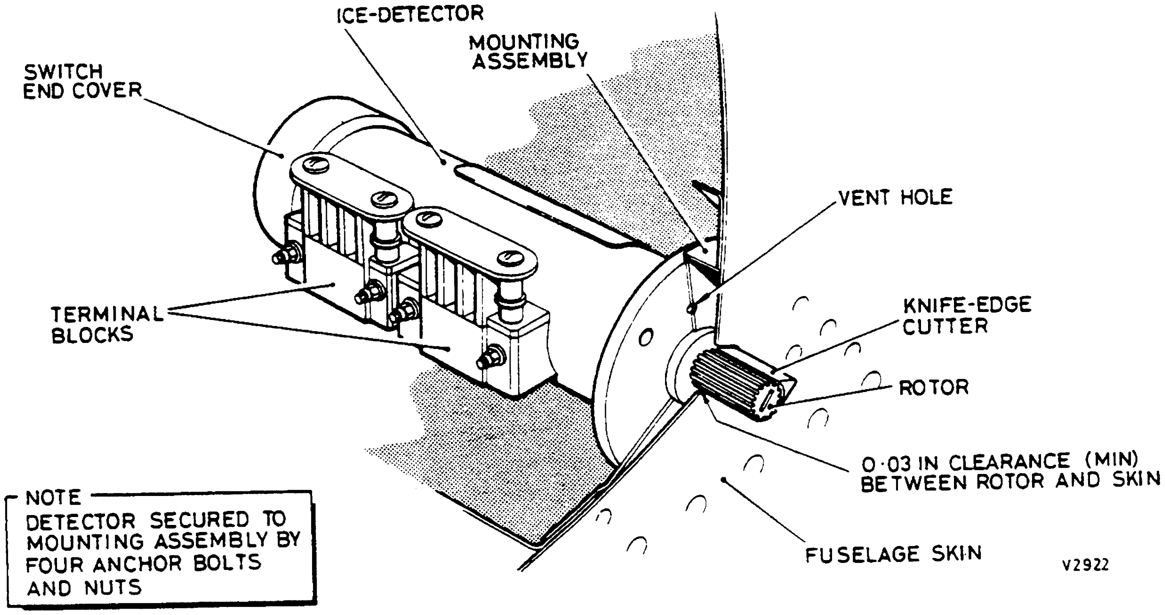
(1) Refer to *Figure 202*. Connect ice detector to test circuit as detailed.

(2) Close SW.1, check that lamp ’A’ is ON and lamp ’B’ is OFF.

(3) Insert the blade of the torque test indicator in the slot on the face of the rotor (*Figure 202*) and apply slight thumb pressure until lamps A and B change over.

NOTE: The lamps should change over before sufficient torque is applied to cause the motor in the detector to labour.

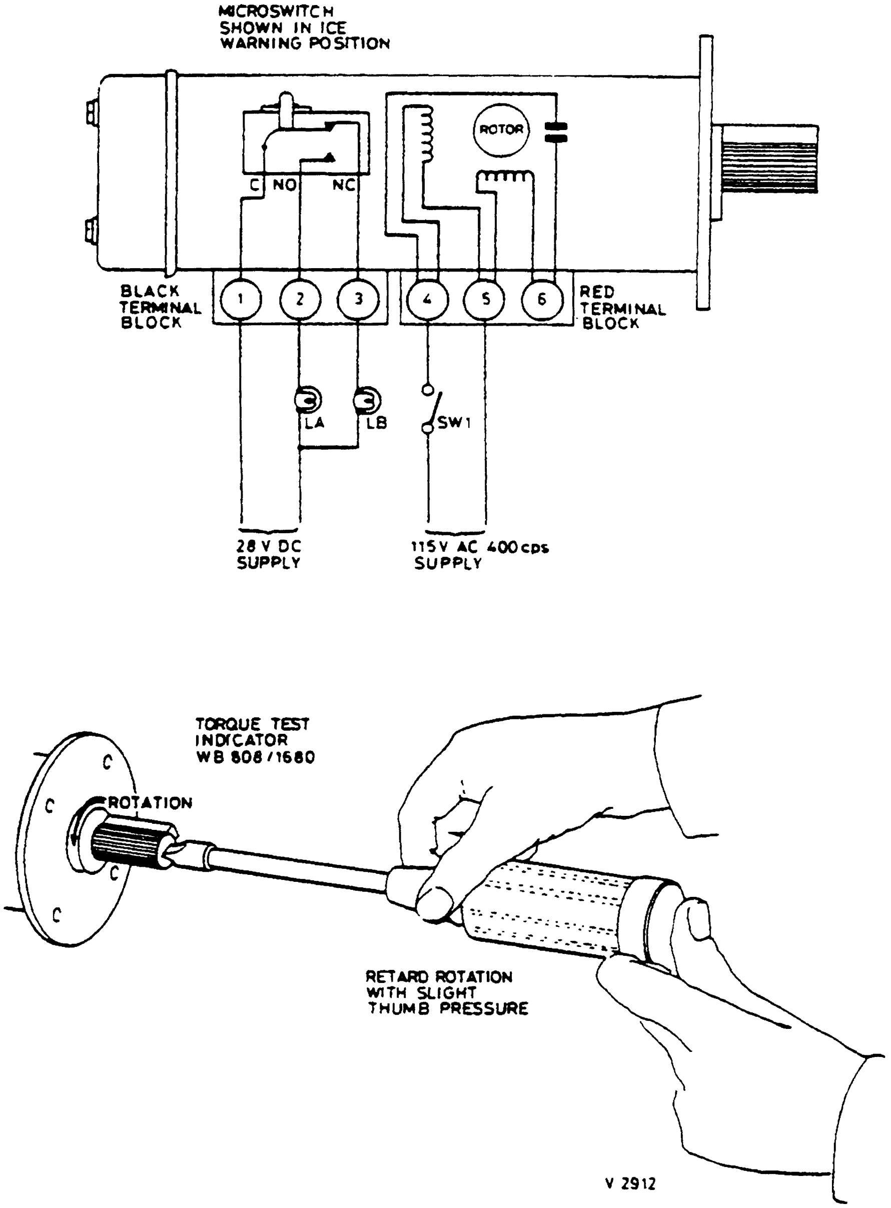
(4) Open SW.1, and remove the detector from the test circuit.



NOTE
DETECTOR SECURED TO MOUNTING ASSEMBLY BY FOUR ANCHOR BOLTS AND NUTS

'Rotary' ice detector installation

Figure 201


MICROSWITCH SHOWN IN ICE WARNING POSITION
C
NO
NC
ROTOR
BLACK TERMINAL BLOCK
1
2
3
4
5
6
RED TERMINAL BLOCK
LA
LB
SW1
28 V DC SUPPLY
115V AC 400cps SUPPLY
TORQUE TEST INDICATOR WB 808/1680
ROTATION
C
C
C
C
RETARD ROTATION WITH SLIGHT THUMB PRESSURE
V 2912

Ice detector test circuit and wiring diagram

Figure 202